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United States
Department of
Agriculture

Forest Service

Tongass
National Forest
R10-MB-635

May 2009

Angoon Hydroelectric Project

Record of Decision

Tongass National Forest
Admiralty Island National Monument
Juneau, Alaska



Angoon Hydroelectric Project ROD - Key Acronyms and Other Terms

ACMP	Alaska Coastal Management Program	GIS	Geographic Information System
ADFG	Alaska Department of Fish and Game	HUC	Hydrologic Unit Code (United States Geological Survey)
ADNR	Alaska Department of Natural Resources	IDT	Interdisciplinary Team
AHMU	Aquatic Habitat Management Handbook	kV	Kilovolts
ANCSA	Alaska Native Claims Settlement Act (1972)	LTA	Land Type Association
ANILCA	Alaska National Interest Lands Conservation Act (1980)	LUD	Land Use Designation
BA	Biological Assessment	LWD	Large Woody Debris
BE	Biological Evaluation	MIS	Management Indicator Species
BMP	Best Management Practice	MMI	Mass Movement Index
CEQ	Council on Environmental Quality	NEPA	National Environmental Policy Act
CFR	Code of Federal Regulations	NFMA	National Forest Management Act (1976)
cfs	Cubic feet per second	NFS	National Forest System
CZMA	Coastal Zone Management Act (1972)	NHPA	National Historic Preservation Act
DEIS	Draft Environmental Impact Statement	NMFS	National Marine Fisheries Service
EFH	Essential Fish Habitat	NOI	Notice of Intent (to publish an EIS)
EIS	Environmental Impact Statement	RMA	Riparian Management Area
EPA	Environmental Protection Agency	ROD	Record of Decision
ESA	Endangered Species Act	SHPO	State Historic Preservation Office
FEIS	Final Environmental Impact Statement	SUA	Special Use Authorization
FERC	Federal Energy Regulatory Commission	TES	Threatened and Endangered Species
Forest Plan	Tongass Land and Resource Management Plan	TUS	Transportation and Utility Systems
Forest Service	United States Department of Agriculture Forest service	USACE	United States Army Corps of Engineers
FSH	Forest Service Handbook	USDA	United States Department of Agriculture
FSM	Forest Service Manual	USFWS	United States Fish and Wildlife Service
		USGS	United States Geological Survey

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1. Record of Decision

Angoon Hydroelectric Project

Forest Service, U.S. Department of Agriculture
Admiralty National Monument
Tongass National Forest
Alaska Region

1.1 SUMMARY

The Angoon Hydroelectric Project Record of Decision (ROD) describes the selection of Alternative 3 for implementation in the Angoon Hydroelectric Project area.

Kootznoowoo, Incorporated, the ANCSA corporation for the city of Angoon, is the project proponent. Kootznoowoo, Inc. asked the Forest Service to do the NEPA process necessary to develop a hydroelectric project to lower the cost of power generation and electric bills in Angoon. Alternative 3, now called the Selected Alternative, was developed as a means of reducing the amount of vegetative clearing required along the transmission line corridor, reducing potential effects to fish habitat in Thayer Creek, and reducing potential effects of road and pipeline/penstock construction on karst terrain and on steep slopes along Thayer Creek. The Selected Alternative requires buried power line, roads located in uplands, instream flow of at least 40 cubic feet per second (cfs) in Thayer Creek, and other terms and conditions to provide protection to resources in the project area.

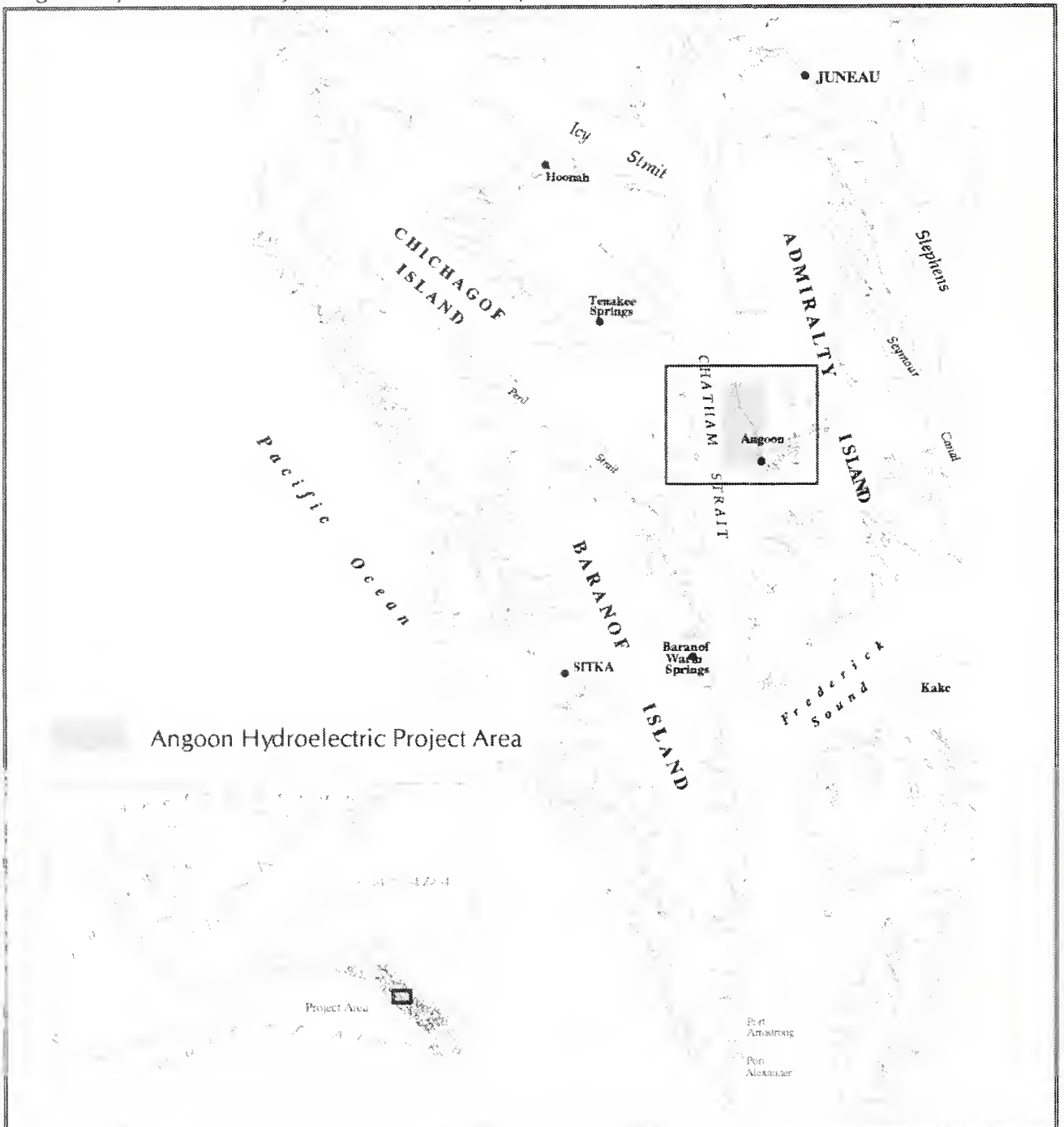
The Forest Service Selected Alternative describes the terms and conditions required to be included in the Special Use Authorization (SUA) to protect resource values within the project area related to the construction and operation of Kootznoowoo, Incorporated's hydroelectric facility on Thayer Creek. Several Federal and State permits are necessary to implement the authorized activities. Implementation of this action including issuance of the Forest Service SUA will not occur until the proponent has acquired all necessary permits and/or permissions in accordance with state and federal law.

1.2 PROJECT LOCATION

The project area is located within Admiralty Island National Monument, Tongass National Forest, Alaska. The proposed hydroelectric dam will be constructed on Thayer Creek with power delivered to Angoon. The project area was authorized through the Alaska National Interest Lands Conservation Act of 1980 (ANILCA) as T. 49 S., R. 67 E. and T. 50 S., R 67 E, Copper River Base and Meridian. The city of Angoon is approximately 50 miles south of Juneau and the project area is just north of Angoon along the east shoreline of Chatham Strait (Figure R-1).

Angoon Hydroelectric Project ROD

Figure R - 1
Angoon Hydroelectric Project Area - Vicinity Map.



10 5 0 10 20 Miles
Scale in Miles



Angoon Hydroelectric Project ROD

Land ownership in the project area is mixed. The Forest Service manages the majority of the land within the project area as part of the Kootznoowoo Wilderness. In the southern portion of the project area, there are private lands, with surface rights owned by Kootznoowoo, Inc., and subsurface interests owned by Sealaska, Inc. (see Figure R-2). The City of Angoon boundaries include section 24, T. 50 S., R. 67 E. and section 19, T. 50 S., R. 68 E.

1.3 DECISION

It is my decision to select Alternative 3 as described in the Angoon Hydroelectric Project Final Environmental Impact Statement (Final EIS). I authorize the actions necessary to implement my decision.

My decision encompasses the following:

- The terms and conditions that will be included in or required prior to issuance of a Special Use Authorization [SUA] to protect water, fisheries, wildlife, recreational, heritage, and scenic values within the project area;
- The maximum term for the SUA;
- Road management objectives for constructed roads;
- Any necessary project-specific monitoring requirements; and

The SUA will contain terms and conditions related to engineering and structural specifications, land-use and administrative fees, insurance requirements, performance bonding requirements, resource protection requirements, and safety requirements in addition to other special clauses deemed appropriate by the Forest Service. The Forest Service is responsible for the regulation and monitoring of construction, operation, and fee collection.

Authorities to prescribe these conditions are found in the Federal Land Policy and Management Act of October 21, 1976, ANILCA, the Endangered Species Act, and other laws and regulations. The final design and construction of the project must be consistent with this Record of Decision (ROD).

This decision is based on the environmental analysis presented in the Final EIS for the Angoon Hydroelectric Project and includes agency, tribal, and public comments received during the comment period on the DEIS as well as input on the Final EIS. This decision meets the Purpose and Need for the project; is consistent with the 2008 Tongass Land and Resource Management Plan and ROD; and is responsive to concerns raised during scoping, information gathered during the environmental analysis, and public and agency comments on the DEIS and FEIS.

Description of the Selected Alternative

The Selected Alternative is displayed in Figure R-2. The Selected Alternative provides modifications, in the form of terms and conditions to be included in a Special Use Authorization (SUA), to Kootznoowoo, Inc.'s Selected Project Arrangement to reduce potential effects to resources in the project area and to meet specific requirements found in the Forest Plan.

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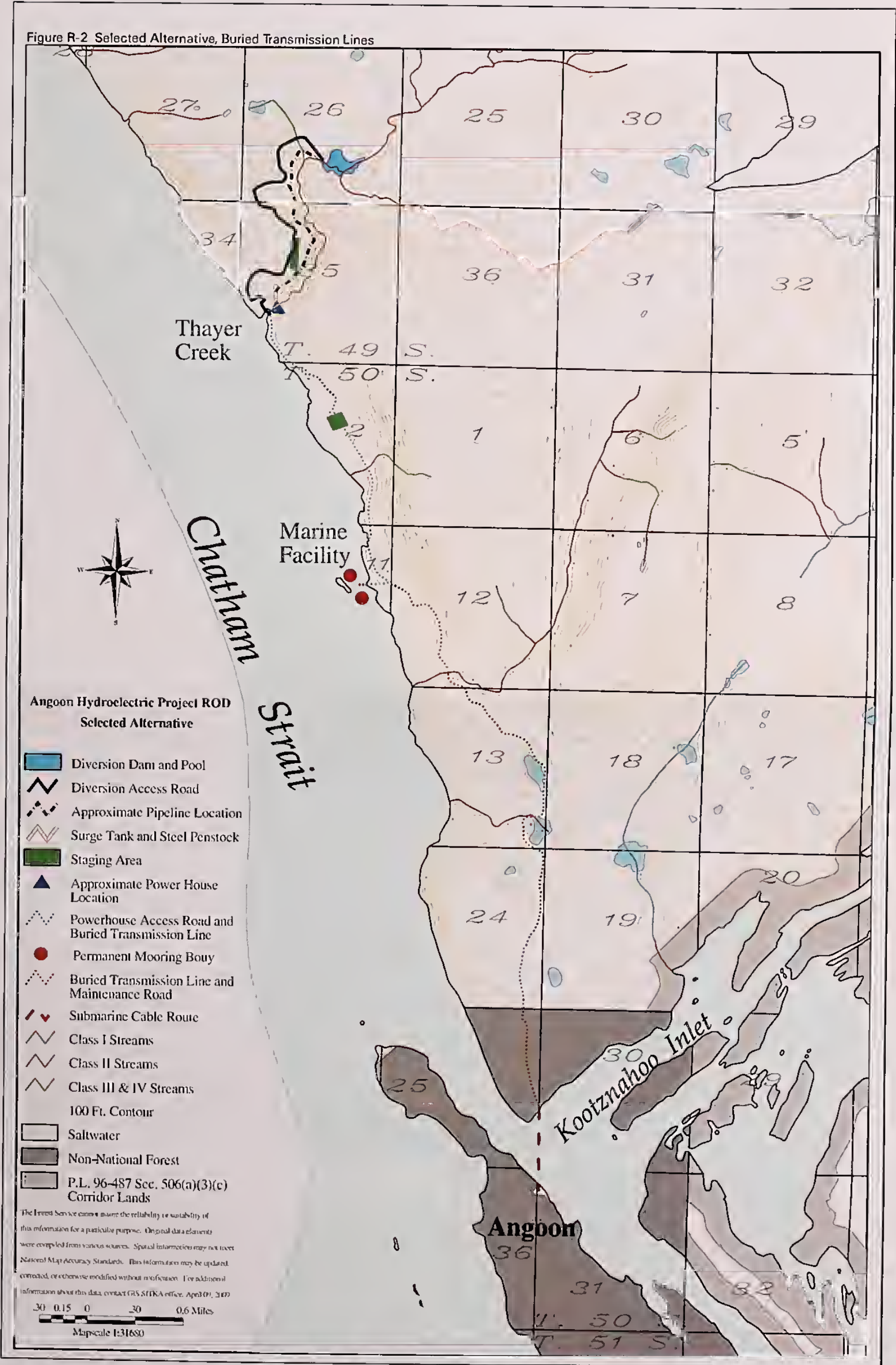
The Selected Alternative includes terms and conditions that are either general or specific in terms of their effect on Kootznoowoo, Inc.'s original proposal.

Specific Terms and Conditions

The Selected Alternative requires that:

- All transmission lines be buried. Exceptions due to difficulties related to terrain may be authorized on a site-specific basis. If burying the powerline is not feasible in the northeast corner of Section 13 in T. 50 S., R. 67 E., that section of powerline corridor will receive additional on-site evaluation prior to clearing to insure it is located below the ridge with minimal southeast exposure to avoid a wind tunnel effect and reduce wind throw risk.
- A minimum instream flow of 40 cfs be maintained at all times in the Thayer Creek bypass reach to minimize freezing temperatures and loss of stream continuity in the bypass reach.
- All water not needed for power generation be returned to Thayer Creek at the diversion dam and sent through the bypass reach.
- The tailrace discharge will be returned above or immediately below the lowest anadromous fish barrier on Thayer Creek to minimize the length of anadromous stream affected by the diversion.
- The road from the marine facilities to the powerhouse be routed to minimize effects to areas identified as high vulnerability karst as well as the streams that flow to the karst features and that the diversion dam access road be routed away from steep slopes along Thayer Creek (see Road Cards in Appendix B for road locations). The final locations of these facilities must be approved by the Forest Service.
- The dam include a low gate feature to pass bedload during specified windows of high flows in May-June and September-October to minimize effects on channel stability and fisheries downstream of the dam.
- Floating wood accumulating behind the dam be disposed of into the bypass reach during high flows in May-June and September-October to minimize effects on channel stability and fisheries downstream of the dam.
- Trees that are in the reservoir be left standing to avoid ground disturbance associated with cutting and removal and to provide habitat complexity.
- All activities and treatments (including tree clearing) must be confined to the project area authorized in ANILCA and described in Section 1.2 (Project Location).
- The access road will be constructed in two unconnected segments. The north segment is accessible from the marine facilities and the south segment accessible from Kootznahoo Inlet. This is in order to avoid construction through the 100-foot deep, 635-foot wide V-notch (at about mile marker 0.8, see Road Cards in Appendix 1). If Kootznoowoo, Inc. proposes to build a road and bridge across this V-notch, additional analysis of effects will be required.

Figure R-2 Selected Alternative, Buried Transmission Lines



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- The term for the SUA will be 30 years. The expected timeline for Kootznoowoo, Inc. to design and construct the project is 3 years or longer.

Project Components

The Selected Alternative includes the following project components (see Figure R-2) as described in Kootznoowoo, Inc.'s Selected Project Arrangement submitted to the Forest Service or as modified to conform to the terms and conditions in the Selected Alternative. Modified components are highlighted.

Marine Facilities to Power Plant

1. Permanent facilities located 1.8 miles south of the outlet of Thayer Creek consisting of mooring buoys and a garage for operation and maintenance vehicles at the mooring facility.
2. Temporary facilities, including a barge landing, staging areas, and a construction camp during project construction.
3. **A 2.2-mile, 12.5 kV transmission line segment, buried along the access road from the powerhouse to the marine facilities.**
Exceptions to line burial due to difficulties related to terrain may be authorized on a site-specific basis.
4. **A 2.2-mile access/maintenance road paralleling the transmission line from the marine facilities to the power plant and rerouted to maintain a minimum 100-foot buffer from areas identified as high vulnerability karst and the streams that flow to these features.**

Power Plant to Diversion Dam

5. A 10-foot high diversion dam on Thayer Creek, approximately 1.5 miles upstream from the mouth of Thayer Creek at an elevation of approximately 250 feet above sea level.
6. A 10- to 20-acre impoundment above the diversion dam.
7. An intake structure with a trashrack, transition section, shutoff valve, sluiceway, and control facilities at the diversion dam.
8. A 1.2-mile, 42-inch diameter pipeline from the intake structure to the powerhouse. The pipeline will be secured to the ground by a system of nylon straps and galvanized steel cable, and to the maximum extent possible will be routed around trees and other obstacles.
9. A 510-foot long, 36-inch diameter penstock from the downstream end of the pipeline to the powerhouse.
10. A 240-foot long, six-foot diameter surge tank above the junction of the pipeline and penstock, potentially with a temporary road built for tank construction.
11. A power plant structure, about 30 feet by 68 feet and 25 feet high, to house two generating units with a total generating capacity of 1,000-kilowatt; the power plant is located about 450 feet downstream of the waterfall.

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12. A 2.1-mile access/maintenance road from the powerhouse to the diversion dam/intake structure that avoids steep and unstable slopes.
13. A water release control structure at the diversion dam to maintain a minimum instream flow of 40 cfs (cubic feet of water per second) at all times below the diversion dam.
14. A spoils/staging area.

Marine Facilities to City of Angoon

15. A 4.2-mile, 12.5 kV transmission line segment, buried from the marine facility to Kootznahoo Inlet. Exceptions to line burial due to difficulties related to terrain may be authorized on a site-specific basis.
16. A 4.2-mile access/maintenance road paralleling the transmission line from the marine facilities to Kootznahoo Inlet.
17. A 0.5-mile (2,700 feet) submarine cable segment from the northern shore of Kootznahoo Inlet to the City of Angoon.
18. Two electrical switch yards near the shoreline where the submarine cable enters and exits Kootznahoo Inlet.

Total tree clearing width along all transmission lines/access roads is expected to be 46-70 feet, with an average of 50 feet wide.

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Table R-1 compares the project activities and components of the Selected Alternative with the other alternatives considered in detail.

Table R-1. Comparison of Alternatives, including the Selected Alternative, by Activity

Activity	Alternative 1 No Action	Alternative 2 Proposed Action	Selected Alternative (Alt. 3) Buried Trans. line	Alternative 4 Submerged Trans. Line
Special Use Authorization	No	Yes	Yes	Yes
Above-ground transmission line	0	6.2 miles	minimized	minimized
Buried transmission line	0	0	6.2 miles as feasible	2.2 miles as feasible
Submerged transmission line	0	0.5 mile	0.5 mile	4.6 miles
Access Road Marine Fac. to Powerhouse	0	2.2 miles	2.2 miles	2.2 miles
Access Road Powerhouse to Dam	0	1.4 miles	2.1 miles	2.1 miles
Access Road Marine Fac. to Kootznahoo Inlet	0	4.0 miles	4.0 miles	0
Temporary Access Rd Surge Tank	0	0.2 mile	0	0
Road/Trans Line Clearing Width	0	46-200 feet	46-70 feet (50 feet avg.)	46-70 feet (50 feet avg.)
Diversion Dam Access Road Location	None	On steep slopes in Thayer Creek canyon	Reroute avoids steep slopes in Thayer Creek canyon	Reroute avoids steep slopes in Thayer Creek canyon
Pipeline Location	None	Follows the contour in Thayer Creek canyon	Follows the contour in Thayer Creek canyon	Follows the contour in Thayer Creek canyon
Penstock Location	None	Same for all alternatives	Same for all alternatives	Same for all alternatives
Marine Facility	None	Same for all alternatives	Same for all alternatives	Same for all alternatives
Switchyards	0	3	3	3
Tailrace Discharge location	None	450 feet downstream of fish barrier	Above or immediately below the lowest anadromous fish barrier	Above or immediately below the lowest anadromous fish barrier

1.4 GENERAL TERMS AND CONDITIONS

Kootznoowoo, Inc.'s development proposal served as the basis for the terms and conditions displayed in the action alternatives in the Final EIS. The analysis documented in the Final EIS disclosed the possible adverse and beneficial effects of implementing the actions proposed under each alternative. The Forest Service uses terms and conditions to mitigate and prevent negative effects on resources in the planning and implementation of land management activities. The application of these measures begins during the planning and design phases of a project. The general terms and conditions summarized below and in the Road Cards (in Appendix 1 of this ROD) are part of the Selected Alternative and will apply to the Angoon Hydroelectric Project development.

General

- The proponent will supply plans and other information for Forest Service review and approval. The Forest Service will review and approve all technical aspects of the project, including design plans, site plans, and specifications as necessary to assure consistency and compliance with the ROD.
- The Forest Service will require special plans of the SUA holder, such as:
 - Abandonment
 - Borrow pit restoration
 - Construction schedule
 - Clearing and disposal
 - Cultural resource management
 - Environmental Compliance and Monitoring
 - Erosion prevention and control
 - Fire
 - Fish and wildlife management
 - Flood plain and wetland protection
 - Grading and profile
 - Hazardous material management
 - Landscape management
 - Operation and Maintenance
 - Public Information
 - Recreation
 - Reservoir/conveyance operation and maintenance
 - Revegetation and/or rehabilitation
 - Road maintenance
 - Safety
 - Sensitive plants/animals protection
 - Sewage/refuse disposal
 - Spill Prevention and Control
 - Spoil disposal
 - Timber removal
 - Transportation
 - Water resources protection

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See Hydroelectric Handbook – Typical Order of Events for Exempted Project (FSH 2709.15 Ch 24.3), Special-Use Authorizations (FSH 2709.15 Chapter 60), and Special Uses Handbook (FSH 2709.11).

- The proponent will provide a qualified and approved environmental compliance monitor to be on-site during construction with authority to ensure compliance with conditions of the various agencies' permits and permissions.
- The Forest Service will review construction plans, specifications, and geotechnical information concerning all facilities on National Forest System lands as part of the SUA operating plan.
- Before issuing the SUA, the Forest Service will require project proponent to provide a final safety and engineering review of the project design by a qualified engineering firm with experience in designing and constructing hydroelectric facilities.
- Ground-disturbing activities associated with the Angoon Hydroelectric project are considered nonpoint pollutant sources under Clean Water Act Sections 208 and 319. Best Management Practices (BMPs) are recognized as the primary control mechanisms for nonpoint source pollution on National Forest System lands. Alaska's Nonpoint Source Pollution Control Strategy (ADEC 2007) describes site-specific application of BMPs, with a monitoring and feedback mechanism, as the approved strategy for controlling nonpoint source pollution. BMPs are described in the Forest Service's Soil and Water Conservation Handbook (USDA Forest Service 2006). BMPs 12.10 and 12.14 address water resource protection in Special Use Permits and Utility Corridors. This ROD and accompanying road cards describe the site-specific application of BMPs for this project. The project proponent will be required to specify BMPs in operating plans subject to further review and approval by the Forest Service.
- At a minimum, the dam must be designed for a 100-year flood, in accordance with State of Alaska guidelines for low hazard dams (Alaska Department of Natural Resources 2005).
- To minimize ground disturbance and water quality impacts, use of ground-based equipment for construction, operation, and maintenance activities will require minimum standard road construction approved by the Forest Service.
- No ground-based equipment will be authorized off roads for any activity unless approved site-specifically by the Forest Service.
- Merchantable timber removed for the project will be appraised and sold to the authorization holder through a settlement contract (36 CFR 223.12 Permission to cut, damage, or destroy trees without advertisement). The settlement contract will outline the requirements associated with removal and disposal of national forest timber in accordance with applicable manual direction and federal regulations. No timber will be harvested within 100 feet of Thayer Creek unless timber removal is needed to facilitate construction activities (to meet Tongass Timber

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Reform Act buffer requirements); no timber will be sold from within 100 feet of Thayer Creek.

- The facilities, roads, and transmission lines must be designed to meet all applicable Forest Plan standards and guidelines.
- Roads developed to implement this project will be for high-clearance vehicles and heavy equipment (see Road Cards in Appendix B).
- Roads constructed for the project will be closed to all motorized uses unrelated to project construction and operation; the project proponent will be responsible for installing effective road closure devices as well as for road maintenance and erosion control.
- If camps are needed in the project area, camps will be located in areas identified for disturbance such as staging areas, rock pits or building sites.

In addition to the above, the following resource-specific conditions will be applied to reduce or mitigate adverse effects on specific natural resources in the project area:

Geology and Soils

- BMPs include, but are not limited to:
 - Road location avoids unstable, sensitive, or fragile areas and restricts blasting (BMPs 14.2, 14.7).
 - Road design and construction maintains natural drainage and controls excavation and sidecast material (BMPs 14.3, 14.9, 14.12).
 - Erosion control measures apply to all disturbed areas and are consistent with invasive species policy (BMPs 12.17, 14.5, 14.8, 14.10, 14.11, 14.18).
- Design-level geotechnical studies must be completed before final layout and design of the project to avoid building project features on unstable slopes.
- Roads shall be held to the minimum feasible number, width and total length consistent with the intended purpose (see Road Cards in Appendix B).

Water Resources

- BMPs include, but are not limited to:
 - Road-stream crossings (including penstock crossing) will be designed to avoid constricting bankfull channel width. Class I, II, and III stream crossings will pass, at minimum, a 50-year flood event (BMP 14.17).
 - Construction of road-stream crossings will minimize disturbance and sediment production (BMPs 14.10, 14.14, 14.17, 14.19).
 - Clearing for roads and/or transmission line corridors will minimize tree-felling in designated streams (see road cards). If debris entering stream has debris dam or diversion potential it must be removed within 48 hours unless approved by the Forest Service (BMP 13.16).

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- The dam will be designed to allow flushing of sediment and large wood into the bypass reach on an as-needed basis.
- The project will divert no more than 82 cfs (cubic feet of water per second) of streamflow from Thayer Creek. The proponent is responsible for obtaining a water right for diversion from Alaska Department of Natural Resources.
- All diverted streamflow will be returned from the powerhouse to the Thayer Creek.
- The powerhouse may not release heated water to Thayer Creek (see monitoring plan).
- The powerhouse must be designed to provide flow downstream of the powerhouse in the event of an unplanned shutdown of the intake or pipeline.
- A plan to collect streamflow data in Thayer Creek must be approved by the Forest Service prior to final design.
- A monitoring plan addressing instream flows, floating debris and sediment at the dam, and stream temperature, ice accumulation, streambed substrate and large wood in the anadromous fish reach is required.

Fisheries

- Resource-specific BMPs include, but are not limited to:
 - BMP 12.17- Revegetation of Disturbed Areas
 - BMP 13.16- Stream Channel Protection
 - BMP 14.6- Timing restrictions for construction activities
- Instream construction shall only occur during low-flow periods (Aug-Sept or Dec-Mar) and employ sediment and erosion control BMPs to minimize downstream sedimentation and direct impacts to resident and anadromous fish.
- No in-water work in salt water shall occur from March 15-June 15 to protect spawning herring and migrating juvenile salmon unless approved by ADFG.
- The intake structure at the diversion dam must be properly installed and screened to protect resident fish. Refer to NMFS reference on intake screen criteria (NMFS 1996).
- Design of the diversion dam must safely pass fish downstream subject to approval by ADFG.
- Design of the tailrace discharge structure must include outfall protection, such as a concrete pad or placed riprap, to decrease or eliminate scouring and sedimentation. Must also be designed so as to not be an attractant flow to escaping fish or allow access to the tailrace.
- Road-stream crossings of Class I and II streams (designated in road cards) will be designed to accommodate fish passage (BMPs 14.17, 12.5)

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- A plan to monitor fish populations in the anadromous habitat is required. Refer to Forest Service guidelines for population assessment (Bryant 2000)
- Floating wood accumulating behind the dam must be disposed of into the bypass reach during high flows in May-June or September-October

Vegetation

- Avoid disturbance of grassy areas on the west side of the small island near the marine facilities to reduce chance of spread of non-native species present.
- Prior to construction, the Forest Service district botanist will mark, on the ground or on aerial photos, the boundaries of the known rare plant populations in or near the proposed project footprint.
- To avoid rare plants, spoils will not be deposited in the large tall sedge fen meadow between the power house and dam.
- To avoid the introduction of invasive species into the project area, plants native to the area should be used for any revegetation or restoration work as identified in the Project Erosion Control Plan.
- Construction vehicles and equipment must be washed before being delivered to the project site.
- Erosion control measures will use weed-free materials. Re-vegetation seed mixtures must be approved by the Forest Service.

Wetlands

- BMPs include, but are not limited to:
 - Roads location and design minimizes number, width and total length of roads on wetlands. Avoid high value wetlands (BMP 12.5)
 - Road construction will minimize excavation, and overburden and debris disposal in wetlands (BMPs 14.3, 14.12, 14.19).
- No discharge of dredged or fill material shall be permitted in wetlands if there is a practicable alternative to the proposed discharge which will have less adverse impact on the aquatic ecosystem in light of overall project purposes (U.S. Army Corps of Engineer guidelines) .
- The project proponent must acquire a Section 404 permit from the Army Corps of Engineers.
- Rock pits and staging areas shall not be located on wetlands.
- Minimum road clearing and side ditching must be used when building roads in wetlands.
- Minimize the loss of tall sedge fen wetlands, which are scarce wetland types on the Tongass National Forest and provide valuable habitat to several terrestrial animals.

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Wildlife

- No vegetation removal is permitted within a 330-foot radius of an active bald eagle nest between March 1 and August 31.
- No active or inactive bald eagle nest trees may be cut down.
- No blasting is allowed within one half mile and repeated helicopter flights are not allowed within a quarter mile of active bald eagle nests. Any restrictions placed upon project activity to minimize disturbance to nesting eagles may be removed if the nest(s) becomes inactive after May 31. Variances to these conditions must be approved through consultation with the USFWS.
- Design and build transmission lines to provide avian safety following design standards and recommendations in Avian Power Line Interaction Committee (2006).
- Prevent habituation of bears to human food/garbage and reduce the chances of human/bear incidents. All camps and work sites are required to use bear-proof garbage disposal methods and store food in bear-proof containers.
- Where practical, road construction and other development activities are not permitted within 500 feet of the anadromous portion of Thayer Creek to minimize effects to brown bear use of key foraging areas.
- The authorization holder shall develop measures to control hunting, trapping, and fishing within the project boundary by the construction workforce and describe in the Fish and Wildlife Management Plan how prohibitions of hunting, trapping and fishing will be implemented and enforced.

Threatened, Endangered, and Sensitive Species

- If any previously undiscovered sensitive plants are encountered before or during implementation of the project the Forest Service must be notified immediately to evaluate the potential risk to the population and recommend avoidance or mitigation measures.
- Check trees for goshawk nests prior to cutting. If previously undiscovered active goshawk nests are found, avoid cutting the nest tree and surrounding trees and notify the Forest Service. The Forest Service will establish a nest management zone consisting of 100-acres of productive old growth centered on the nest. No continuous disturbance likely to result in nest abandonment is permitted within 600 feet of the nest between March 15 and August 15 (USDA 2008a). Report goshawk sightings to the Forest Service for follow-up.
- A minimum 330-foot buffer must be marked around any osprey nest tree found in or near the project area before or during implementation of the project (USDA 2008a). No activities "likely to disturb nesting activity" may occur within this buffer until the nesting season ends.

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Scenery

- The smallest area needed for the marine facility will be cleared of trees and vegetation. During construction, shoreline rocks will be protected from scarring or damage.
- In the Lakes Viewshed (Figure 3-5, Chapter 3), a minimum of 100-foot wide buffer of mature trees must be maintained between the project elements and lakeshores, where feasible.
- Where feasible, a windfirm buffer of mature trees must be left along the shoreline in the Chatham Strait Shoreline Viewshed (Figure 3-5, Chapter 3), to screen the transmission facilities, access road and construction staging area from the Visual Priority Travel Routes and Use Areas.
- Project elements, including buildings, the pipeline, transmission poles, and generation facilities must be constructed of visually compatible materials or painted earth-tone colors to blend with the surroundings.

Cultural Resources

- A Forest Service approved archaeologist must be present on-site during project layout and construction to monitor changes between the approved design and actual layout.
- If an historic property cannot be avoided during layout, or a new site is discovered during construction, project work will cease until a mitigation plan is developed. A mitigation plan will be developed in consultation with the State Historic Preservation Office (SHPO), Kootznoowoo, Inc., the Forest Service, the Angoon Community Association, and the City of Angoon. A Memorandum of Agreement formalizing the mitigation plan and a timeline for its completion will be executed prior to proceeding.
- The Admiralty National Monument Ranger must be contacted immediately and work cease if historic properties or cultural materials not previously considered, are encountered during project implementation.
- Should human remains be encountered during project implementation all work in the locality will cease and the Forest Archaeologist and the Alaska State Troopers shall be contacted. If Native American remains are encountered on National Forest System lands the Forest Service will follow Native American Graves Protection and Repatriation Act regulations set forth in 43 CFR 10. Federally recognized Tribes and ANCSA Corporations will be notified of inadvertent discoveries and consulted to determine an action plan on how to proceed.

1.5 MONITORING

Project-specific Monitoring

Routine implementation monitoring is part of the administration of a special use authorization.

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Appendix 2 of this ROD displays monitoring required for this project. Additional detail on resource monitoring, including water resource monitoring, is found in the resource reports (see for example Thompson 2009). Monitoring displayed in Appendix 2 of the ROD, summarizes the monitoring requirements, authority, and responsibility by resource. The monitoring shown in Appendix 2 is part of this decision.

1.6 REASONS FOR THE DECISION

In making my decision, I carefully considered the need for this project as well as the concerns raised during scoping, comments on the DEIS, and discussions with the proponent and other interested parties. I considered ANILCA and 2008 Forest Plan direction relevant to this project, and the concerns and values of the public. I considered all viewpoints and incorporated them where feasible and consistent with the Purpose and Need of the project.

My decision to implement the Selected Alternative conforms to the 2008 Forest Plan and Federal Land Policy and Management Act of 1976. I considered the project's Purpose and Need and the issues when reaching my decision, as well as other resource impacts and concerns:

- My decision is responsive to the need to comply with the requirements of ANILCA Section 506(a) by establishing resource protection measures to be required for the development of the hydroelectric project proposed by Kootznoowoo, Inc. at Thayer Creek within Admiralty Island National Monument.
- My decision is responsive to Kootznoowoo, Inc.'s desire to reduce the cost of power generation and lower electric rates for Angoon residents.

My decision to implement the Selected Alternative considered the other concerns that arose in the EIS.

- I considered the effects that the hydroelectric development will have on water, fishery, wildlife, recreational, heritage, and scenic values. The Selected Alternative provides adequate protection and reduces negative impacts on area resources to moderate, minor, or negligible levels consistent with Forest Plan guidelines. Table R-2 compares the effects of the Selected Alternative with the other alternatives considered in detail.
- I considered the effects that the hydroelectric development will have on specific resource concerns such as scenic values, fish habitat, karst, and water quality. The Selected Alternative reduces or avoids many negative effects on these specific resources by including terms and conditions that limit project effects on these resources. Buried transmission line will substantially reduce the amount of vegetative clearing required along the transmission line corridor minimizing the impacts to scenery and wildlife habitat. Rerouting the roads reduces potential effects of road and pipeline/penstock construction on karst terrain and on steep slopes and water quality along Thayer Creek. Terms and conditions in the Selected Alternative that involve fisheries, such as the requirements for a higher level of water discharge into the bypass reach of Thayer Creek, low gate feature to

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pass bedload, and disposal of floating wood into the bypass reach will minimize effects on fisheries downstream of the dam by reducing loss of stream continuity and reducing effects on channel stability.

- I considered the concern that buried power line may increase the cost of the project. I recognize that there are trade-offs associated with buried power line. The Selected Alternative requires that the transmission line be buried where technically feasible to minimize the visual effects of clearing and of an overhead line. This type of installation is somewhat more expensive than an overhead line but is a common method and practice in the industry. At this conceptual stage there is insufficient field information for an accurate assessment of subsurface conditions along the proposed route. As a result installation costs are more uncertain and may increase considerably if extensive bedrock excavation is required. Because a buried line would be relatively protected from weather related damage, maintenance costs would be lower and reliability of the system would be higher than with an overhead line. As a result, the unanticipated costs of diesel generation that would occur during power outages would be less. A buried line could be repaired using normal practices and equipment.
- In making my Angoon Hydroelectric project decision, I considered concerns about climate change (FEIS, Chapter 3, Section 3.14, Social Economics). In terms of carbon dioxide emissions, less fuel would be needed after development of this project to generate electricity under the Selected Alternative than under the No Action Alternative; therefore, the production of carbon dioxide would be reduced. The diesel fuel burned by the Inside Passage Electric Cooperative, Inc. for electricity generation in 2006 produced the equivalent of 1,877 tons of carbon dioxide. While this is only a small portion of the worldwide carbon dioxide emissions, implementation of this project would be supportive of the Forest Service mission to “sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations” and the Forest Service’s emphasis on climate change.

Any needs for a different course of action that might affect what I am deciding now will be addressed through existing planning procedures to determine whether changes in the Angoon Hydroelectric Project management are warranted.

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Table R-2. Comparison of Alternatives, including the Selected Alternative, by Resource Effect

Activity	Alternative 1 No Action	Alternative 2 Proposed Action	Selected Alternative (Alt. 3) Buried Trans Line	Alternative 4 Submerged Trans Line
Geology				
Effects to karst	No Effect	0.2 mile of road cross high vulnerability karst lands; sediment and debris would enter karst system. A Forest Plan amendment would be needed	Due to avoidance there are no effects	Due to avoidance there are no effects
Soil				
Project area exposed to surface erosion (acres)	0	45.5	48.2	24.9
Road in areas over 67% slope (feet)	0	1,650	1,500	150
Water¹				
Minimum Instream Flow (CFS)	26 (predicted natural extreme minimum flow)	20	40	40
Winter Streamflow	No effect	Moderate effects	Moderate effects	Moderate effects
Summer Streamflow	No effect	Minor effects	Minor effects	Minor effects
Spring and Fall Streamflow:	No effect	Negligible effects	Negligible effects	Negligible effects
Sediment supply from above dam	No effect	Minor to moderate	Negligible to minor	Negligible to minor
Large wood supply	No effect	Minor	Negligible	Negligible
Winter minimum water temperature and dissolved oxygen	No effect	Moderate effects	Moderate effects	Moderate effects

¹ Impacts increase from no effect to negligible to minor to moderate to major; definitions of the level of effects are located in Chapter 3 in the Water Resources section.

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Activity	Alternative 1 No Action	Alternative 2 Proposed Action	Selected Alternative (Alt. 3) Buried Trans Line	Alternative 4 Submerged Trans Line
Summer maximum water temperature	No effect	Minor effects	Negligible to minor effects	Negligible to minor effects
Erosion and sediment (from ground-disturbing activities)	No effect	Major effects	Minor effects	Minor effects
Fisheries				
Effects of flows on fish and fish habitat	No change (no effect)	For Reaches B & C: Low flow periods would extend earlier into the fall and later into the spring; would support few, if any, incubating eggs or resident fish through the winter; may freeze for longer periods in the winter or increase to potentially lethal temperatures during the summer.	This alternative will mimic more natural flow regimes. Dewatering will be less likely. Additional flow will provide increased pool depth, greater stream connectivity, and decrease harmful icing conditions	This alternative will mimic more natural flow regimes. Dewatering will be less likely. Additional flow will provide increased pool depth, greater stream connectivity, and decrease harmful icing conditions
Effects due to location of discharge water from the power plant	No change (no effect)	Discharge location would likely cause a moderate reduction in anadromous fish populations	Flows would mimic natural conditions; little potential effect to anadromous fish and habitat below the barrier	Flows would mimic natural conditions; little potential effect to anadromous fish and habitat below the barrier
Effects to Thayer Creek from road parallel to Thayer Creek	No change (no effect)	Road could degrade riparian habitat and increase the suspended sediment load.	Greatly reduced potential for landslides and introducing sediment and debris into creek	Greatly reduced potential for landslides and introducing sediment and debris into creek
Vegetation				
Rare Plants	No effect	Low to moderate effects	Low to moderate effects	Low to moderate effects

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Activity	Alternative 1 No Action	Alternative 2 Proposed Action	Selected Alternative (Alt. 3) Buried Trans Line	Alternative 4 Submerged Trans Line
Invasive Species	No effect	Low potential to introduce invasive species in area up to 40 acres	Low potential to introduce invasive species in area up to 40 acres	Low potential to introduce invasive species in area up to 30 acres
Wetlands				
Linear miles of road built on wetlands	0	2.6 miles	2.6 miles	1.1 miles
Biodiversity and Wildlife				
Effect on Connectivity (acres of productive old-growth removed from beach fringe and riparian management)	0	57	28	23
Effects on Management Indicator Species and Migratory Birds	No Effect	Small loss (less than 1%) of potential habitat; expected to maintain viable, well dispersed populations of MIS.	Small loss (less than 1%) of potential habitat; expected to maintain viable, well dispersed populations of MIS.	Small loss (less than 1%) of potential habitat; expected to maintain viable, well dispersed populations of MIS.
Relative Effects of Alternatives on Management Indicator Species and Migratory Birds	No Effect	Greatest effect of action alts. on MIS because of larger acreage of forest habitat converted for transmission line clearing and easier access	Intermediate effect of action alts. on MIS because access is similar to Alt. 2, but forest habitat loss is lower than Alt. 2	Lowest impact of action alts. on MIS because it affects the least POG and foraging habitat, and provides the least access improvement
Threatened, Endangered, and Sensitive Species				
BE Effects Determination for humpback whale and Steller sea lion	No effect	No effect	No effect	No effect
BE Effects Determination for Kittlitz's murrelet, osprey, Peale's peregrine falcon, and trumpeter swan	No impacts	No impacts	No impacts	No impacts

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Activity	Alternative 1 No Action	Alternative 2 Proposed Action	Selected Alternative (Alt. 3) Buried Trans Line	Alternative 4 Submerged Trans Line
BE Effects Determination for Northern goshawk	No impacts	May impact individuals	May impact individuals	May impact individuals
BE Effects Determination for Sensitive Plants	No effect	No adverse effect	No adverse effect	No adverse effect
Scenery	No Effect	Most visibility of the transmission line. Constructs access roads and transmission line above ground	Some visibility of the transmission line. Constructs access roads, and buries majority of transmission line along road corridor	Least visibility of the transmission line. Constructs access roads, and submerges majority of transmission line under water
Cultural Resources	No Historic Properties Affected	Historic Properties not adversely affected	Historic Properties not adversely affected	No Historic Properties Affected
Subsistence	No Effect	Does not pose a significant possibility of a significant restriction on subsistence	Does not pose a significant possibility of a significant restriction on subsistence	Does not pose a significant possibility of a significant restriction on subsistence
Wilderness²				
Effects (outside the project area) to “undeveloped” and “outstanding opportunities for solitude” Wilderness characteristics	No Effect	Most negative effects due to visibility and maintenance of road and transmission line.	Some negative effects due to road; less visible impact due to buried line.	Least negative effects due to elimination of the overland transmission corridor.
Socio-economics				
Estimated cost comparison for transmission lines ³	None	\$1,235,000	\$1,303,000	\$1,415,000

² The Forest Service recognizes that Congress exempted the project area from requirements of the Wilderness Act through ANILCA section 506 (a)(3)(D)

³ Alternative costs differ primarily in terms of construction and maintenance costs of the transmission line. Dollar values are from an estimate done in 2000.

1.7 PUBLIC INVOLVEMENT

The Council on Environmental Quality (CEQ) defines scoping as "...an early and open process for determining the scope of issues to be addressed and for identifying the key issues related to a Proposed Action" (in Title 40 Code of Federal Regulations [CFR] 1501.7). The scoping process invited public participation and collected initial comments.

Scoping

Public scoping for the Angoon Hydroelectric Project started with publication of the Notice of Intent on October 14, 2004 (Federal Register, Volume 69, No. 198, pages 60976-60978). A project scoping notice was sent to interested members of the public at that time. The mailing list for the notice consisted of 84 tribes and corporations, individuals, agencies, private businesses, and nongovernmental organizations. An invitation to attend public meetings was published in the Juneau Empire. Representatives of the Forest Service and Kootznoowoo, Inc. hosted scoping meetings on October 14, 2004, in Angoon and October 15, 2004 in Juneau. Public comments were solicited at the meetings, and comments were received in writing throughout the formal scoping period (through October 29, 2004).

Total attendance at these two 2004 public meetings was 22 individuals. Angoon and Juneau residents contributed both spoken and written comments. Nine written comments were received during scoping. Comments are filed in the Angoon Hydroelectric Project record available for review at the Admiralty National Monument office in Juneau, Alaska.

Meetings and Consultation with Agencies, Communities, and Others

Consultation with many State and Federal agencies started in 2005 for this project and continued through 2009. Consultation with the State Historic Preservation Officer (SHPO) for determination of eligibility of sites for inclusion on the National Register of Historic Places and determination of effects has been ongoing since December 2005. The Forest Service consulted with the US Fish and Wildlife Service (USFWS) on bald eagle management for this project including transmission line design and bald eagle surveys starting in January 2005. Further consultation will be initiated if final location and design indicates that encroachment upon the 330-foot buffer for any eagle nest is unavoidable. Consultation with National Marine Fisheries Service (NMFS) related to marine mammals was initiated early in the process, and continued in 2008.

Forest Service representatives held a meeting with representatives of Alaska Department of Fish and Game (ADFG), USFWS, and NMFS on May 19, 2008, in Juneau. The Forest Service presented information and an update on the project and the group discussed information needs related to aquatic effects. On August 5, 2008, Rich Jackson of the Corps of Engineers and Peter Naoroz of Kootznoowoo, Inc. accompanied Forest Service personnel in the field on the proposed Angoon Hydroelectric Project. Jackson consulted with Forest Service personnel and Peter Naoroz about the requirements and expectations for the permit issued by the Corps of Engineers under Section 404 of the Clean Water Act. Additional meetings were held with agencies and Kootznoowoo, Inc.'s representatives in the winter of 2008/2009. Essential Fish Habitat (EFH) consultation with NMFS was initiated in November 2008. Contacts were made with NMFS during

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and after their 45-day review. As of February 2009, NMFS has sent the Forest Service no comments on the EFH determination and no conservation recommendations.

Draft EIS Availability of Draft EIS for Public Comment

Availability of the Draft EIS was announced through a Notice of Availability in the Federal Register on May 25, 2007, and through a legal notice in the Juneau Empire. The Notice of Availability started a 45-day comment period that began May 26. The Forest Service also mailed copies of the Draft EIS to federal and state agencies, Alaska native tribes and corporations, and municipal offices, and anyone else who had requested them.

After the Draft EIS was distributed, two open houses were held to provide information to those interested in the project. One open house was held in Angoon on June 27, 2007; 20 people attended. Twenty-two people attended the second open house in Juneau on June 28, 2007. A meeting was also held in Juneau on August 1, 2007, with four individuals representing Kootznoowoo, Inc. and interested local groups.

Subsistence hearings were not necessary, and were not held, for this project because none of the alternatives posed a significant possibility of a significant restriction on subsistence.

Analysis and Incorporation of Public Comment on the Draft EIS

Fourteen agencies, organizations, and individuals submitted written comments on the Angoon Hydroelectric Project Draft EIS. The Interdisciplinary Team (IDT) used these comments to further refine and develop the FEIS. The comments and the Forest Service responses to these comments are displayed in Appendix C of this FEIS.

Final EIS Publication of the Final EIS

The Notice of Availability of the Final EIS was published in the Federal Register on March 20, 2009. Copies of the Final EIS were mailed to Federal and State agencies, federally recognized tribal governments and corporations, municipal offices, and to those who requested them or responded to the Draft EIS. Meetings were held in Juneau on April 2, 2009 with six individuals representing Kootznoowoo, Inc. and interested local groups and in Angoon on April 10, 2009 with nine individuals representing tribal government, the City of Angoon, and other interested parties.

After the ROD is released, a legal notice will be published in the *Ketchikan Daily News*, the newspaper of record, which will initiate a 45-day appeal period on the decision for this project (36 CFR 215), during which the project cannot be implemented. Copies of the ROD will be mailed to those who received the Final EIS, those who request them or those who responded to the Final EIS. The Final EIS and ROD are also available at the Admiralty National Monument offices at the Juneau and Sitka Ranger District offices in Juneau and Sitka, AK and the Forest Service office in Angoon.

1.8 CONSULTATION WITH TRIBAL GOVERNMENTS

The National Historic Preservation Act (1966 as amended) strengthens the relationship between the Forest Service and Indian Tribes (defined as federally recognized tribes, Alaska Native Corporations and Native Hawaiian Organizations) in consultation regarding site significance and the potential affects on historic and archaeological sites.

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Executive Order 13175 requires that federal agencies consult with tribes during planning activities.

In 2003 Kootznoowoo, Inc. asked the Forest Service to begin the NEPA process necessary to develop a hydropower facility at Thayer Creek. Since then the Admiralty Island National Monument Ranger and various staff members have met with representatives and leaders of Kootznoowoo, Inc., the Angoon Community Association and elected officials of Angoon to clarify their proposal, provide updates and consult with them regarding specific aspects of the project. This consultation and coordination began early in the process and continued as both routine consultation meetings and project specific briefings. Notes and summaries of these meetings can be found in the EIS planning record.

The tribes and corporations received copies of the FEIS and will receive the ROD.

1.9 ALTERNATIVES CONSIDERED

Four alternatives were considered in detail. Each action alternative is consistent with the 2008 Forest Plan. The action alternatives are all based on the Selected Project Arrangement proposal submitted by Kootznoowoo, Inc. The Forest Service alternatives all included modifications, in the form of terms and conditions in the Special Use Authorization (SUA), to Kootznoowoo, Inc.'s Selected Project Arrangement to reduce potential effects to resources in the project area and to meet specific requirements found in the Forest Plan. Each action alternative in the Final EIS displayed the individual components of Kootznoowoo Inc's proposal that were included in that alternative.

Kootznoowoo Inc's Selected Project Arrangement included a diversion dam, intake structure, marine facility, three access roads, two staging areas, transmission lines, a power plant, a surge tank, 6,100 feet of 42-inch diameter pipeline and 510 feet of 36-inch diameter pipe. The hydroelectric plant would be a run-of-river facility using only the water available in the natural flow of the river. Under normal conditions, run-of-river facilities involve minimal water storage, and power generation fluctuates with the stream flow. Appendix A of the Final EIS contains the executive summary from the HDR feasibility report. The planning record includes the entire report.

For a complete description of these alternatives, refer to Chapter 2 of the Final EIS.

Alternative 1 (No Action)

Under the No Action alternative, the Forest Service would not have issued a special use authorization (SUA) for the project, and the project would not be constructed. Diesel generators would continue to be used to supply energy for the community of Angoon unless alternative energy sources were developed. Although selection of this alternative would deny Kootznoowoo, Inc. the statutory rights granted by ANILCA, CEQ regulations (40 CFR 1502.14d) require that a "no action" alternative be analyzed in every EIS.

Alternative 2 (Proposed Action)

The HDR Alaska, Inc. Selected Project Arrangement was presented to the Forest Service by Kootznoowoo, Inc. and was accepted as Kootznoowoo Inc.'s proposal. Terms and conditions listed under Section 1.4, General Terms and Conditions were then added to Kootznoowoo, Inc.'s Selected Project Arrangement, as authorized by ANILCA, to reduce potential effects to resources in the project area and to meet specific requirements found

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in the Forest Plan. The Forest Service Proposed Action (Alternative 2) consisted of those terms and conditions. All of those terms and conditions would have been included in the SUA based on the components from the Selected Project Arrangement proposal submitted by Kootznoowoo, Inc.

The list of project components is located in the Final EIS, Section 2.3.3. It displays the major improvements proposed by Kootznoowoo, Inc. or those assumed necessary to implement the Proposed Action and includes the following:

Marine Facilities to Power Plant

1. Permanent mooring buoys and a garage, temporary marine facilities, including a barge landing, staging areas, and a construction camp during project construction, overhead transmission line from the powerhouse to the marine facilities, access/maintenance road paralleling the transmission line from the marine facilities to the power plant.

Power Plant to Diversion Dam

2. A diversion dam on Thayer Creek approximately 250 feet above sea level, a 10- to 20-acre impoundment above the diversion dam, an intake structure, a pipeline, a penstock, a surge tank with a ¼ mile temporary road built for tank construction, a power plant structure located about 450 feet downstream of the waterfall, access/maintenance road from the powerhouse to the diversion dam/intake structure, a water release control structure at the diversion dam to maintain a minimum instream flow of 20 cfs (cubic feet of water per second) at all times below the diversion dam and a spoils/staging area.

Marine Facilities to City of Angoon

3. Overhead transmission line segment from the marine facility to Kootznahoo Inlet, access/maintenance road paralleling the transmission line, submarine cable segment from the northern shore of Kootznahoo Inlet to the City of Angoon, and two electrical switch yards.

As proposed, approval of two of the road locations would have required require a non-significant amendment to the Forest Plan to allow for: 1) road construction over areas identified as high vulnerability karst and the streams that flow to the features and 2) road construction in the Thayer Creek canyon.

Alternative 3 Alternative 3 was developed as a means of reducing the amount of vegetative clearing required along the transmission line corridor, reducing potential effects to fish habitat in Thayer Creek, and reducing potential effects of road and pipeline/penstock construction on karst terrain and on steep slopes along Thayer Creek. Consideration of a buried transmission line is also a requirement of the Forest Plan.

Alternative 3 is the Selected Alternative with the modifications shown above.

Alternative 4 Alternative 4 was developed to eliminate uplands impacts associated with the construction of an access road and transmission line from the marine facilities to Kootznahoo Inlet; it would have done this by submerging the transmission line in

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Chatham Strait. Consideration of a submerged transmission line is also a requirement of the Forest Plan.

This alternative would have been similar to Alternative 3, except that Kootznoowoo, Inc. would not be authorized to construct an overland transmission line from the marine facility to Kootznahoo Inlet. The only feasible way for Kootznoowoo, Inc. to comply with this restriction would have been to utilize a submarine transmission cable laid off-shore of Admiralty Island to the City of Angoon. This alternative has about 4 miles less access road (and associated tree clearing) than the other alternatives.

1.10 ENVIRONMENTALLY PREFERRED ALTERNATIVE

Implementing Alternative 1, the No-action Alternative, would have resulted in no environmental disturbance in the project area. Therefore, Alternative 1 is the environmentally preferred alternative. However, negative environmental impacts would or could occur even under Alternative 1. Diesel generation of power would continue to occur at a higher level than in the action alternatives with resultant higher carbon dioxide and other emissions and higher fuel spill potential

1.11 REASONS FOR NOT SELECTING OTHER ALTERNATIVES

I did not select Alternative 1, No-action, because environmental analysis showed that the desirable outputs of the Purpose and Need could be achieved without unreasonable effects to the ecological and human environments. These effects are described under the reasons for this decision and in Chapter 3 of the FEIS. Additionally, choosing Alternative 1 would deny Kootznoowoo, Inc. statutory rights granted by ANILCA.

I did not select Alternative 2 primarily because of negative effects the project would have on multiple resources without the addition of specific terms and conditions. The proposed dam access road would not meet Forest Plan standards and guides for soil and water and transportation because it is located on unstable terrain in vicinity of Thayer Creek. This road location would have major negative effects on erosion and sediment in the stream and would be difficult and expensive to build. The proposed marine facility-Kootznahoo Inlet road does not meet Forest Plan standards and guidelines because it crosses high vulnerability karst features. The minimum instream flow of 20 cfs would result in low flow periods that would extend earlier into the fall and later into the spring; would support few, if any, incubating eggs or resident fish through the winter, and may freeze for longer periods in the winter or increase to potentially lethal temperatures during the summer. Additionally, the tailrace return location would result in 450 feet of anadromous fish habitat being dewatered. Alternative 2 would result in much more extensive modification to the landscape than the Selected Alternative because of the much wider clearing widths needed for an above-ground transmission line.

Alternative 3 was selected.

Although Alternative 4 addressed many of the same concerns that Alternative 3 addressed, I did not select Alternative 4 because of the additional technical complexity of

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this alternative. Laying a submarine cable along Chatham Strait would require specialized/expensive installation and specialized/expensive maintenance. Because this specialized equipment is not readily available, a failure of a submerged line would likely result in significant delays for repairs and extended dependence on diesel power generation. .

1.12 ALTERNATIVES NOT CONSIDERED IN DETAIL

In addition to the alternatives described above, several additional alternatives were considered during the analysis but eliminated from detailed study (Section 2.4, Angoon Hydroelectric FEIS, Chapter 2). These alternatives were discussed during the development of the alternatives and after comments on the DEIS were received. Many of them were suggested by comments received through public scoping. Some portions of the recommendations were included as design elements for the action alternatives. Other alternatives were outside the scope of the EIS. A summary of these alternatives and the reasons why they were not analyzed in detail is in Chapter 2 of the FEIS and further information is available in the project record.

1.13 PERMITS, LICENSES, AND CERTIFICATIONS

Several Federal and State permits are necessary to implement the authorized activities. Implementation of this action (including issuance of the Forest Service SUA) will not occur until the proponent has acquired any necessary permits and/or permissions in accordance with state and federal law. Prior to the signing of the SUA for the Angoon Hydroelectric Project, Kootznoowoo, Inc. is responsible for obtaining all necessary permits and reviews from federal and state agencies. These include, but are not limited to:

U.S. Army Corps of Engineers

- Approval of discharge of dredged or fill material into waters of the United States (Section 404 of the Clean Water Act of 1977, as amended)
- Approval of construction of structures or work in navigable waters of the United States (Section 10 of the Rivers and Harbors Act of 1899)

U.S. Environmental Protection Agency

- Permits under Clean Water Act Sections 401, 402, and 404

State of Alaska, Department of Fish and Game

- Fish Habitat (Title 16) Permit

State of Alaska, Department of Natural Resources

- Authorization for occupancy and use of tidelands and submerged lands
- Alaska Coastal Management Program
- Water Resource Authorization
- Hazard Potential Classification and Jurisdictional Review (to determine if Alaska Dam Safety Program certification is needed)

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State of Alaska, Department of Environmental Conservation

- Solid Waste Disposal Permit (Section 402 of the Clean Water Act)

1.14 FINDINGS REQUIRED BY LAW

Several of the laws and executive orders listed in Chapter 1 of the FEIS require project-specific findings or other disclosures.

National Forest Management Act (NFMA)

The 2008 Forest Plan complies with all resource integration and management requirements of 36 CFR 219 (219.14 through 219.27). Application of 2008 Forest Plan direction for the Angoon project ensures compliance at the project level. All required interagency review and coordination has been accomplished.

Through review of the analysis in the Final EIS for the Angoon Hydroelectric Project I find that the Selected Alternative incorporates all applicable management direction from the 2008 Forest Plan and is fully consistent with its goals, objectives, and Forestwide standards and guidelines, as they apply to the project area.

Alaska National Interest Lands Conservation Act (ANILCA) of 1980; Sections 810 and 506

A subsistence evaluation was conducted for the four alternatives, in accordance with Alaska National Interest Lands Conservation Act (ANILCA) Section 810. This evaluation indicates that the potential foreseeable effects from the Selected alternative do not indicate a significant possibility of a significant restriction of subsistence uses for any subsistence resources. See Chapter 3, Subsistence section, in the FEIS for more detail.

ANILCA Section 506 granted Kootznoowoo, Inc. certain rights for development of a hydroelectric facility at Thayer Creek; mandated the decision space and level of involvement of the Secretary of Agriculture (Forest Service); and specifically exempted the hydropower project from the requirements of the Wilderness Act. Kootznoowoo, Inc. has the statutory right to develop, own, and operate a hydroelectric power facility within the confines of the legal description. The Forest Service (for the Secretary of Agriculture) must be responsive to this mandate, and may prescribe certain conditions for the protection of potentially affected resources on Admiralty Island. This NEPA decision responds to the mandate in ANILCA and determines the terms and conditions in the SUA to protect water, fisheries, wildlife, recreational, and scenic values within the project area.

Bald Eagle Protection Act

This project complies with the Bald Eagle Protection Act. Bald eagle habitat will be managed in accordance with the Interagency Agreement established with the USFWS. Terms and conditions would be included in the authorization to provide buffer zones and timing restrictions on construction activities near known nests. If nest protection stipulations become infeasible, the project proponent will need to request a variance from the US Fish and Wildlife Service. The Selected Alternative is not anticipated to have a significant direct, indirect, or cumulative affect on any bald eagle habitat.

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Cave Resource Protection Act of 1988

No known significant caves in the project area will be directly or indirectly affected by project activities in the Selected Alternative. The 2008 Forest Plan Karst and Caves standards and guidelines are applied to areas known or suspected to contain high vulnerability karst resources. High vulnerability karstlands were buffered from the activities occurring in the Selected Alternative. The Selected Alternative will not have an effect on the karst features found within the project area.

Clean Air Act of 1970 (as amended)

Emissions from the implementation of the Selected Alternative will be of short duration and are not expected to exceed State of Alaska ambient air quality standards (18 AAC 50).

Clean Water Act (1977, as amended)

Congress intended the Clean Water Act of 1972, as amended through 2002, to protect and improve the quality of water resources and maintain their beneficial uses. Section 313 of the Clean Water Act and Executive Order 12580 of January 23, 1987 address federal agency compliance with water pollution control mandates. Agencies must be consistent with requirements that apply to "any governmental entity" or private person. Compliance is to be in line with "all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution."

Most of the ground-disturbing activities associated with the construction of the Angoon Hydroelectric project are considered nonpoint sources. Clean Water Act Sections 208 and 319 address nonpoint source pollution. Best Management Practices (BMPs) are recognized as the primary control mechanisms for nonpoint source pollution on National Forest System lands. Alaska's Nonpoint Source Pollution Control Strategy (Alaska Department of Environmental Conservation [ADEC] 2007) describes the site-specific application of BMPs, with a monitoring and feedback mechanism, as the approved strategy for controlling nonpoint source pollution. BMPs are described in the Forest Service's Soil and Water Conservation Handbook (USDA Forest Service 2006). This Handbook is incorporated into the Forest Plan. Under the terms and conditions of the special use authorization, the project proponent will be required to specify additional BMPs in operating plans subject to further review and approval by the Forest Service. The design of proposed roads for the Selected Alternative was guided by standards, guidelines and direction in the 2008 Forest Plan, and applicable Forest Service manuals and handbooks. The road cards (Appendix 1 of the ROD) contain specific details on practices prescribed to prevent or reduce nonpoint sediment sources.

The Angoon Hydroelectric project may also be subject to permitting processes guided by Clean Water Act Sections 401 and 402. Obtaining all necessary Clean Water Act permits is the responsibility of the project proponent. A discharge of dredge or fill material requires Section 404 permitting in waters of the United States, including wetlands (404(f)(1)(A)). Roads must be constructed and maintained in accordance with BMPs to assure that flow and circulation patterns and chemical and biological characteristics of the waters are not impaired (404)(f)(1)(E). The BMPs that must be followed are specified in 33 CFR 323.4(a). These specific BMPs are incorporated into the Soil and Water Conservation Handbook under BMP 12.5.

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The State of Alaska's antidegradation policy states that (1) existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected; and (2) if the quality of a water exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality must be maintained and protected (ADEC 2008). We expect the application of BMPs, together with monitoring requirements described in this decision, to ensure compliance with this policy.

Coastal Zone Management Act (CZMA) of 1972 (as amended)

Under the Coastal Zone Management Act (CZMA), activities that affect any land or water use or any natural resource of the coastal zone of Alaska must be consistent with the Alaska Coastal Management Program (ACMP). The ACMP lists the type of Forest Service special use authorizations the State and the Forest Service agree are likely to have coastal effects, and therefore require ACMP consistency review. Authorizations for hydroelectric projects are on the list. Accordingly, the Angoon Hydroelectric Project must be reviewed by the State of Alaska for consistency with the ACMP. It is the responsibility of Kootznoowoo, Inc. to initiate the required review by completing a Coastal Project Questionnaire (CPQ) and submitting it to the Alaska Department of Natural Resources, Division of Coastal and Ocean Management (DCOM). Under the CZMA, the Forest Service is prohibited from issuing a SUA to Kootznoowoo, Inc. for this project until DCOM determines this activity is consistent with the ACMP.

Endangered Species Act (ESA) of 1973 (as amended)

A Biological Evaluation/Assessment was prepared for the Angoon Hydroelectric project, as required by Section 7 of the Endangered Species Act (ESA), as amended (available in the Project Record). The Selected Alternative is not anticipated to have a direct, indirect, or cumulative effect on threatened or endangered species or their critical habitat, in or outside the project area. Consultation was done with USFWS (March 24, 2005); no terrestrial threatened or endangered species are known to occur in the Angoon Hydroelectric project area.

Magnuson-Stevens Fishery Conservation and Management Act of 1996

Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act states that all Federal agencies must consult with the NMFS for actions or proposed actions that may adversely affect Essential Fish Habitat (EFH). The Act promotes the protection of EFH through review, assessment, and mitigation of activities that may adversely affect these habitats.

The potential effects of the project on EFH have been evaluated (Watershed and Fish resources, Chapter 3, FEIS). The descriptions and the analysis lead me to a determination that the Angoon Hydroelectric project may adversely affect EFH; however, this risk is minimized through the implementation of 2008 Forest Plan standards and guidelines and BMPs.

Several factors were considered in evaluating the potential effects on EFH:

- Habitat loss and alteration of the Class I habitat.
- BMPs will be implemented to protect water quality and aquatic habitat for all freshwater streams. See the unit cards for specific applications of BMPs.

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- Bridges will be placed at all road crossings over fish streams to minimize risks of sediment production and blockage of fish passage. Sediment disturbance during construction.
- Disturbance to the marine fishery.
- Outfall design which could become an attractant flow to adult salmon.

In accordance with the agreement of June 28, 2007 between the Forest Service and the NMFS for consultation on EFH, the Forest Service sent a copy of the Angoon Hydroelectric DEIS to NMFS. No comments were received from NMFS on the DEIS. The EFH determination was sent to NMFS in November 2008, initiating consultation on the EFH prior to the release of the FEIS. Contacts were made with NMFS during and after their 45-day review. NMFS sent the Forest Service no comments on the EFH determination and no conservation recommendations. A summary of the original EFH Assessment is included in Chapter 3 of the FEIS.

Based on our coordination with NMFS I find that the Angoon Hydroelectric Project may adversely affect EFH. By implementing 2008 Forest Plan standards and guidelines and the BMPs, negative effects of the selected actions on EFH will be avoided and minimized. Additional impacts to EFH are likely to occur only from unforeseen events such as landslides, debris blockages of culverts, and road failures.

Migratory Bird Treaty Act of 1918, as amended

The Migratory Bird Treaty Act of 1918 (amended in 1936 and 1972) prohibits the taking of migratory birds, unless authorized by the Secretary of Interior. The law provides the primary mechanism to regulate waterfowl hunting seasons and bag limits, but its scope is not just limited to waterfowl. Over 100 species of birds migrate from other states and countries to Alaska to breed, nest, and fledge their young. Most of these birds fly to interior or northern Alaska and only pass through the project area on the way to their breeding grounds. The migratory species that may stay in the area utilize most, if not all, of the habitats described in the analysis for breeding, nesting, and raising their young. The effects on these habitats were analyzed for this project.

The decision will not have a significant direct, indirect, or cumulative effect on any migratory bird species in the project area. The project may affect individuals or small groups and their nests from the clearing of trees and shrubs or the disturbance caused by construction activities.

National Historic Preservation Act (NHPA) of 1966 (as amended)

Heritage resource surveys have been conducted in the project area, following inventory protocols as detailed in the Second Amended Programmatic Agreement among the USDA Forest Service, Alaska Region, the Advisory Council on Historic Preservation, and the Alaska State Historic Preservation Officer. Our reviews and consultation have resulted in my determination of Historic Properties Not Adversely Affected.

Native communities have been contacted and public comment encouraged. The Forest Service has satisfied the consultation process with the State Historic Preservation Officer. The FEIS and this ROD lay out protective measures to protect known historic properties and any undiscovered historic properties that might be encountered during project

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implementation in addition to a requirement to have an on-site archaeological monitor present during construction to ensure that historic properties are protected. See the discussion under Heritage resources in Chapter 3 of the FEIS.

Tongass Timber Reform Act (TTRA) of 1990

Where possible, timber will not be harvested (removed) within the 100-foot buffer zones for all Class I and Class II streams which flow directly into Class I streams as required in Section 103 of the TTRA. Where possible, these trees would be left on the ground and not removed. The Selected Alternative complies with TTRA.

Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule

The Angoon Hydroelectric Project FEIS and this ROD have been prepared to be consistent with the Forest Service Travel Management Final Rule. I have determined that the roads included in the Selected Alternative is the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of NFS lands in this area (36 CFR 212.5).

1.15 EXECUTIVE ORDERS

Executive Order 11988 (Floodplains)

Executive Order 11988 directs agencies to avoid construction in and modification of floodplains. Although this act deals largely with avoiding flood damage and hazards, it also directs agencies to restore and preserve the natural and beneficial values of floodplains while planning for land use. Due to the nature of the Angoon Hydroelectric Project, facilities (dam, penstock, access roads, powerhouse, tailrace) will be located within the Thayer Creek floodplain. The project proponent will be required to account for flood hazards in the design of the project, and minimize the footprint of disturbance within the floodplain. Plans and designs are subject to review and approval by the Forest Service. The project design and the application of BMPs combine to minimize adverse effects on floodplains.

Executive Order 11990 (Wetlands)

Executive Order 11990 requires Federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands. Because wetlands are so extensive in the Angoon Hydroelectric project area, it is not feasible to avoid all wetlands

Road construction requires the filling-in of wetlands and creates permanent loss of wetland habitat. Effects to wetlands are minimized through the application of BMPs. Whenever practicable this project avoids impacting wetlands.

Executive Order 12898 (Environmental Justice)

Executive Order 12898 directs Federal agencies to state clearly in the EIS whether a disproportionately high and adverse human health or environmental impact on minority populations, low-income populations, or Indian tribes is likely to result from the proposed action and any alternatives. Executive Order 12898 also directs Federal agencies to conduct effective public participation with low-income and minority communities. The public participation process involved public scoping through notification in local

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newspapers, agency public websites, written letters to individuals, agencies, governments, and notices in the Federal Register. The impact of this project is expected to be similar among local populations; minority populations, or low-income populations should not be disproportionately impacted under any alternative. Nearby Alaska Native and American Indian populations have been considered within the analysis of the proposed alternatives. The Angoon Community Association was informed throughout project planning. Members were encouraged to comment at any point in the process to ensure their concerns will be addressed. Public meetings were also held in Angoon and Juneau to assist people in understanding the proposal, alternatives, and how issues were addressed. These meetings also gave the public opportunities to highlight other issues or concerns they had. With the avoidance of heritage resource sites and the consideration of traditional values and uses, Native populations should not be disproportionately impacted under the Selected Alternative.

Executive Order 12962 (Aquatic Systems and Recreational Fisheries)

Executive Order 12962 directs Federal agencies to evaluate effects on aquatic ecosystems and recreational fisheries; develop and encourage partnerships; promote restoration; provide access; and promote awareness of opportunities for recreational fishery resources. The Selected Alternative minimizes the effects on aquatic systems through project design, application of standards and guidelines, BMPs, and site-specific mitigation measures. With the application of 2008 Forest Plan standards and guidelines, including those for riparian areas, no significant adverse effects to freshwater or marine resources will occur. Recreational fishing opportunities will remain essentially the same because the Selected Alternative will not disturb or impact existing opportunities. Partnerships continue to be used to leverage Federal project funds to address water quality concerns in areas of the Tongass National Forest; however, none have been proposed for recreational fisheries in conjunction with this project.

Executive Order 13007 (Indian Sacred Sites)

Executive Order 13007 directs Federal agencies to accommodate access to and ceremonial use of American Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites. In a government-to-government relationship, the tribal government is responsible for notifying the agency of the existence of a sacred site. A sacred site is defined as a site that has sacred significance due to established religious beliefs or ceremonial uses, and which has specific, discrete, and delineated location, which has been identified by the tribe. Tribal governments or their authorized representatives have not identified any specific sacred site locations in the project area.

Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments)

Executive Order 13175 directs Federal agencies to respect tribal self-government, sovereignty, and tribal rights, and to engage in regular and meaningful government-to-government consultation with tribes on proposed actions with tribal implications. The Forest Service met with or contacted local tribes during the planning stages of the project as previously noted in Meetings and Consultation with Tribal Governments.

1.16 PROJECT RECORD

The project record for this project includes the DEIS and FEIS, 1997 and 2008 Forest Plans, all material incorporated by reference, and other critical materials produced during the environmental analysis of this project. The project record is available for review at the Admiralty National Monument office in Juneau, Alaska.

1.17 IMPLEMENTATION PROCESS

Implementation of this decision may occur no sooner than 50 days following publication of the legal notice of the decision in the *Ketchikan Daily News*, published in Ketchikan, Alaska.

This project will be implemented in accordance with the Federal Land Policy and Management Act, ANILCA, the Multiple Use Sustained Yield Act, other laws and regulations, the Title 36 Code of Federal Regulations Part 251, and Forest Service Manual and Handbook direction for Special Uses Management, contained in FSM 2700 and FSH 2709.11 and FSH 2709.15. This direction provides a bridge between project planning and implementation and will ensure execution of the actions, environmental standards, and mitigations approved by this decision, and will ensure compliance with the applicable laws. All pertinent BMPs will be applied to the Selected Alternative.

Implementation of all activities authorized by this Record of Decision will be monitored (as displayed in Appendix 2 of this ROD) to ensure that they are carried out as planned and described in the FEIS and this ROD.

Appendix 1 to this Record of Decision contain the Selected Alternative's road cards. These cards are an integral part of this decision because they document the specific resource concerns, management objectives, design elements, and mitigation measures to govern the layout of the construction of roads. These cards will be used during the implementation process to assure that all aspects of the project are implemented within applicable standards and guidelines and that resource effects will not be greater than those described in the FEIS. Similar cards will document any changes to the planned layout which may occur during implementation.

The implementation record for this project will display:

- Each transportation facility and other project components as actually implemented,
- Any proposed changes to the design, location, standards and guidelines, or other mitigation measures for the project, and
- Authorization of the proposed changes.

1.18 PROCESS FOR CHANGE DURING IMPLEMENTATION

Any future changes to the design and construction of the project will be the responsibility of Kootznoowoo, Inc. and could require the preparation of a supplemental EIS before the Forest Service issues a SUA.

Proposed changes to the authorized project actions will be subject to the requirements of the National Environmental Policy Act (NEPA), the National Forest Management Act of 1976, Section 810 of the ANILCA, the CZMA, and other laws concerning such changes.

In determining whether and what kind of NEPA action is required for proposed changes during implementation, the Forest Supervisor will consider the criteria set forth in the CFRs (40 CFR 1502.9(c)), and FSH 1909.15, sec. 18 for determining whether to supplement an existing environmental impact statement. In particular, the Forest Supervisor will determine whether the proposed change is a substantial change to the Selected Alternative as planned and already approved, and whether the change is relevant to environmental concerns. Connected or interrelated proposed changes regarding particular areas of specific activities will be considered together in making this determination. The cumulative impacts of these changes will also be considered.

Minor changes are expected during implementation to better meet on-site resource management and protection objectives. If changes to the terms and conditions included in this EIS occur or new information is brought forward, the Tongass change analysis process will be used to determine whether additional environmental analysis and public involvement are necessary and to document any modifications to the project in the project record.

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1.19 RIGHT TO APPEAL

This decision is subject to administrative review (appeal) pursuant to Title 36 Code of Federal Regulations (CFR) Part 215. Individuals or organizations who submitted comments during the comment period specified at 215.6 may appeal this decision. The notice of appeal must be in writing, meet the appeal content requirements at 215.14 and be filed with the Appeal Deciding Officer:

Denny Bschor, Regional Forester
Alaska Region
US Department of Agriculture
709 W. 9th Street
P.O. Box 21628
Juneau, AK 99802-1628


Email address: appeals-alaska-regional-office@fs.fed.us
Fax: (907) 586-7840

The Notice of Appeal, including attachments, must be filed (regular mail, fax, e-mail express delivery or messenger service) with the Appeal Deciding Officer at the correct location within 45 calendar days of the date that the legal notification of this decision is published in the *Ketchikan Daily News*, the official newspaper of record. The publication date in the newspaper of record is the exclusive means for calculating the time to file and appeal. Those wishing to appeal this decision should not rely upon dates or timeframe information provided by any other source.

Hand-delivered appeals will be accepted at the Regional Office during normal business hours (8:00 am through 4:30 pm) Monday through Friday, excluding holidays.

Implementation of decisions subject to appeal pursuant to 36 CFR Part 215, may occur on, but not before, five business days from the close of the appeal filing period, if no appeals are received.

For additional information concerning this decision, contact Jeff DeFreest, Acting District Ranger, Admiralty National Monument, 8510 Mendenhall Loop Road, Juneau, Alaska, 99801, or call (907) 586-8790.



FORREST COLE
Forest Supervisor

5.8.09

Date

Angoon Hydroelectric Project ROD

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Appendix 1

Road Cards

Introduction

The following road cards are for all roads in the Angoon Hydroelectric project. These roads are needed for ongoing use and maintenance of project facilities but are not under National Forest jurisdiction. These roads are classified as forest roads, not National Forest System roads.

The road lengths contained within the road cards differ by a small degree from those given in the maps and the rest of the document. The road card lengths were determined by field measurements utilizing a hip chain. The field measurements tend to exaggerate to a small degree the actual lengths due to going through brush and around trees. The road lengths shown elsewhere in the document are a result of obtaining GPS points at roughly 500 foot intervals. The GPS points are loaded into GIS and the points are connected with the road locations shown on the maps. The GIS lengths tend to be slightly shorter than actual lengths because it straightens out the turns and does not account for slope distances.

36 CFR Part 212.1 defines a Forest road or trail as “A road or trail wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.

Road cards have been created as a reference and to describe site-specific resource protection measures to be included in the Special Use Authorization (SUA). Figures displaying road locations are included with the road cards. The District Ranger has approved these RMOs; signed copies of these RMOs are in the Angoon Hydroelectric project record.

Only Class I, II, and III streams are displayed and described in these cards. Most streams within the project area were mapped using a coarse scale inventory. This inventory used aerial photo interpretation and limited field verification in the immediate vicinity of the road and the shoreline. Field surveys of proposed roads as part of this project were used to generate the narratives. These surveys included walking proposed roads and recording probable stream class and other observations at road-stream crossings. Streams in these locations were not fully mapped, but GPS points were taken at each stream crossing point to establish Milepost points. Road locator notes and GPS points are in the project record. The narratives in the road cards provide the most accurate information to date regarding the number and types of stream crossings. The type and size of crossings described in these road cards may change upon completion of a design and recommendations by the State via a Title 16 permit. Forest Service fisheries biologists did not survey the transmission corridor and inventory efforts by the project proponent could confirm the status of fish habitat. The Forest

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

Service GIS layer lists streams along the transmission corridor as Class II, but that does not guarantee the presence of fish.

General road descriptions are shown on the Road Management Objectives portion of the road cards and are defined as follows:

- Functional Class: Local (L), Collector (C), and Arterial (A) classifications
- Service Life: Long (L) or Short (S), Constant (C) or Intermittent (I)
- Traffic Service Level: Traffic Service Level anticipated for the design (A, B, C, or D) that takes into consideration the characteristics of the road and operating conditions. The applicable traffic service level for the project area is D: D-Traffic flow is slow and may be blocked by management activities; two-way traffic is difficult, backing may be required; rough and irregular surface; travel with low clearance vehicles is difficult; single purpose facility.

Operational Maintenance Levels indicate the level of road maintenance, in this case Maintenance Level 2, during activities. Objective Maintenance Levels (maintenance levels 2) indicate the long-term maintenance plan for the roads (after the initial construction) and incorporate Traffic Service Levels, as described in the following definitions. The following maintenance levels apply to both Operational and Objective Maintenance Levels; applicable maintenance levels for the project area are:

- Maintenance Level 2 - Assigned to roads operated for use by high-clearance vehicles. Roads are maintained for high-clearance vehicles and monitored for resource protection. Traffic would be minor, consisting of construction vehicles and administrative uses. Provide frequent cleanout of ditches and catch basins to assure controlled drainage. Control roadside brush to maintain sight distance. Grade as needed to maintain crown and running surface. Provide water bars, rolling dips, out sloping, etc., to assure controlled runoff until any needed maintenance can be performed on the primary drainage system.

The road segments are described using mileposts as beginning and ending points. Lengths are given in miles (mi). Road width is given in feet (ft); in the attached tables, road width is the total running surface width.

Road locations and information have been determined using field surveys and on the ground reconnaissance. Field data will continue to be gathered, and road locations/construction methods may be refined to minimize or mitigate impacts to resources. Changes would be documented and analyzed in a NEPA change analysis (FSH 1909.15 Tongass Supplement 1909.12-2009-1 Section 18). Change Analysis is defined in the 2008 Forest Plan ROD (p.70) as: "This process includes a review of new information and circumstances relevant to environmental concerns to determine if additional analysis is warranted."

General Mitigation Measures

The source(s) of each general measure is listed after the measure in terms of individual Forest-wide Standards and Guidelines (see Chapter 4 of the Forest Plan) or BMPs (USDA Forest Service 2006). Measures with application to a particular road are listed on the individual road cards as Site-specific Design Criteria.

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

Soil/Water Protection during Road Design and Construction

Road location avoids unstable, sensitive, or fragile areas (BMPs 14.2, 14.7). Road design and construction maintains natural drainage and controls excavation and sidecast material (BMPs 14.3, 14.9, 14.12). Construction of road-stream crossings would minimize disturbance and sediment production (BMPs 14.10, 14.14, 14.17, 14.19).

Soil/Water Protection during Road Management

Conduct road maintenance and snow removal operations to minimize disruption of road surfaces, embankments, ditches, and drainage facilities. (BMPs 14.20 and 14.23)

Reducing Erosion and Sedimentation

Erosion control measures apply to all disturbed areas and are consistent with invasive species policy (BMPs 12.17, 14.5, 14.8, 14.10, 14.11, 14.18)

Accidental Spills

Implement measures and plans to prevent the contamination of soil and water from accidental spills of petroleum products and hazardous substances. (BMPs 12.8 and 12.9)

Fisheries

Instream construction activities are restricted within and potentially upstream of Class I habitat during periods when the risk to fish and habitat is the highest. Restrictions upstream of Class I habitat are dependent on the distance and channel conditions that exist between the instream construction and the habitat. (BMP 14.6)

Fish passage is required in identified fish streams and all structures in fish streams will need to be designed to meet State of Alaska fish passage standards; the type and size of crossings provided may change upon completion of a design and recommendations by the State of Alaska via Title 16.

Wildlife

No bald eagle nest trees may be cut down and no vegetation removal or project related activities are permitted within 330 feet of any bald eagle nest. No blasting is allowed within one half mile and repeated helicopter flights are not allowed within a quarter mile of active bald eagle nests. All nests are considered active from March 1 to May 31. Surveys will be required to determine activity between June 1 and August 31; the project proponent will be responsible for conducting surveys. Variances to these conditions must be approved through consultation between the USFWS and the project proponent.

There are no known goshawk nests within the project area. Report goshawk sightings or nests to the Forest Service for follow-up. If previously undiscovered active goshawk nests are found avoid cutting nest tree and surrounding trees; the FS will establish a 100-acre nest management zone. No continuous disturbance likely to result in nest abandonment is permitted within 600 feet of the nest between March 15 and August 15 (USDA 2008a).

There are no known osprey nests within the project area. Report osprey sightings or nests to the Forest Service for follow-up. If previously undiscovered osprey nests are found, the FS will establish a minimum 330-foot buffer around the nest tree (USDA 2008a). No project related activities may occur within this buffer until the nesting season ends.

Establish forested buffers of approximately 500 feet where protective measures are needed along certain anadromous streams where bears forage (USDA FS 2008a). Minimize the

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

footprint of required project components within the Thayer Creek riparian area to minimize impacts to bear habitat.

Invasive Species Design Elements

On October 19, 2007, the Tongass National Forest implemented a supplement to the Forest Service Manual 2080 concerning invasive plant species (Supplement No.: R10 TNF – 2000-2007-1). The following design elements will be used to address invasive species in the Angoon Hydroelectric project area.

- Road brushing and other road maintenance associated with the project should be designed to reduce the risk of spreading weed species (see FSM 2080 Supplement No.: R10 TNF – 2000-2007-1).
- Construction vehicles and equipment must be washed before being delivered to the project site.
- To avoid the introduction of invasive species into the project area, plants native to the area should be used for any revegetation or restoration work.
- Erosion control measures will use weed-free materials. Re-vegetation seed mixtures must be approved by the Forest Service (FSM 2080 Suppl. No.:R10 TNF – 2000-2007-1, Exhibit 2).
- Vehicles and heavy equipment must be cleaned prior to entering the project area.

In addition to design elements, project proponent will monitor roads, marine and staging facilities and construction areas for new non-native plant introductions for at least three years following completion of construction, biennially thereafter for the life of the project, and for one year following road closures. District Botanist will receive a copy of monitoring reports annually or biennially, as applies.

Project proponent will eradicate or control any newly introduced high priority invasive plant populations in the project area for the life of the project following FS and NEPA guidelines for manual (pull/dig) and mechanical (mowing/seed whacking) treatments. Pesticide use in Wilderness is restricted (USDA FSM 2150.3.3) and must be approved by the Regional Forester (USDA FSM 2151.04a). District Botanist will receive a copy of treatment reports annually.

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

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ANGOON HYDROELECTRIC PROJECT ROD



Road Management Objectives

Project/EIS: Angoon Hydroelectric EIS	System: Thayer Creek	Land Use Designation: Wilderness
Route No.: N/A	Route Name: Pipeline	Status: Planned
Begin M.P.: 0.0	Length (miles): 2.1	Begin Termini: Bridge over Thayer Creek.
		End Termini: Bend in Thayer Creek near proposed dam site.

General Design Criteria and Elements

Functional Class: Local	Service Life: LC	Traffic Service Level: D	Surface: Shot Rock	Width: 14'	Critical Vehicle: Lowboy	Design Vehicle: Log Truck	Design Speed: 10 mph
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Intended Purpose/Future Use: This road serves as the connection between the powerhouse and the diversion dam. The road is the conduit for moving supplies to the dam site and pipeline corridor. After the construction phase of the dam and pipeline, the road will continue to be used for maintaining the facilities.

Maintenance Criteria

Begin Milepost 0.00	End Milepost 2.1	Operational Maintenance Level: 2	Objective Maintenance Level: (desired future condition) 2
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Maintenance Narrative: The road will be maintained at a Maintenance Level 2 level for the duration of the hydroelectric project.

Operation Criteria

Highway Safety Act: No **Jurisdiction:** Kootznoowoo

Travel Management Strategies:

Encourage:	N/A
Accept:	Administrative use.
Discourage:	N/A
Prohibit:	Public motorized use.
Eliminate	N/A

Travel Management Narrative: The road will be used for administrative use only.

District Ranger Approval

(signature) _____ Date: _____

Site-specific Design Criteria

Road Name: Pipeline

Road Location: The road segment begins at the Thayer Creek bridge site and ends near the dam site. The road was located to avoid the steep slopes directly above Thayer Creek. A large construction staging area will be required for construction of the dam and pipeline. A suitable location for the site was noted between MP 0.5 and 0.7. This area was primarily forested with some forested wetlands, relatively level, and without any significant streams. On the north side of Thayer Creek, a short spur will be necessary to access the surge tank at the upstream end of the penstock. This spur has not been located on the ground.

The detailed road location information is provided in the table below.

Milepost (miles)	Average Side-slope (%)	Length (feet)	Comments
0.0 to 0.1	0-10	631	Easy construction. Some fill is needed between Sta. 5+33 and 6+31.
0.1 to 0.2	40-60	594	Difficult construction. 15 and 20 foot cuts as well as a large fill across a Class III stream requiring a 36" pipe, some full bench. Steep grades.
0.2 to 1.7	0-40	7661	Primarily easy construction.
1.7 to 1.8	20-50	765	Moderate construction including a 60" stream crossing. Steep grades.
1.8 to 2.1	0-20	1185	Easy construction. Plenty of relatively level ground for dam construction staging if necessary.

Wetlands: The proposed Diversion Access and Surge Tank Construction Access Roads cross about 38 feet of Tall Sedge Fens. The remaining wetland is both forested wetland and scrub/shrub muskeg. Minimize the road footprint through the wetlands and provide adequate hillslope drainage (33 CFR BMPs 1, 3). Road construction through these wetlands is unavoidable (BMP 14.2). Overlay construction is recommended to minimize disturbance to the wetland and ensure hydraulic connectivity of the roaded wetland with the surrounding areas (BMPs 12.5 and 14.17).

Erosion Control: An erosion control plan for construction and maintenance will be developed according to standard project specifications (BMP 14.5). The plan will address excavation and endhaul in the vicinity of steep slopes (MP 0 to 0.2, MP 1.8), erosion control during construction and post-construction at stream crossings MP 0 and MP 1.8., erosion control during construction and post-construction at rock pits, and revegetation materials and schedules.

Rock Pits: Potential rock pits were noted near MP 0.2 and MP 1.3. Roughly 27,000 cubic yards of shot rock will be needed for the construction of this road. During periods of high rainfall (as defined in current Regional specifications), blasting operations will be suspended to minimize potential for vibration-induced mass movement (BMP 14.6). Additional blasting may be necessary at other locations along the road; the Regional specifications for blasting apply to these locations as well.

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

Resource Information:

Soils/Water: This road location avoids unstable areas in accordance with Forest Plan direction. See next segment (Powerhouse) for Thayer Creek stream crossing information. At Milepost 1.8: Minimize equipment crossing and streambank disturbance during construction. Avoid moving natural debris, control construction-related sediment and direct to settling area (BMP 14.14). Crossing location avoids deeper notches up and downstream.

Fisheries: Construction activity in or around Class I habitat is generally restricted during periods of high risk to fish. (BMP 14.6). Locations for sidecast material excavated for bridge and powerhouse construction should be selected to minimize risk of material entering surface waters (BMP 14.12).

Wildlife: Minimize the footprint of road construction and other development activities within 500 feet of the anadromous portion of Thayer Creek to minimize effects to brown bear use of key foraging areas. No vegetation management or project related activities within 330' of any bald eagle nest tree. No blasting within ½ mile of active bald eagle nests. Surveys will be required to identify active nests. If these measures are not feasible, a variance will be required from the US Fish and Wildlife Service.

Botany: A population of the rare plant, interior sedge (*Carex interior*), was found in the northwestern end of the large meadow on the proposed dam access road. That route passes through forest approximately 135 meters to the west of the meadow and is not expected to impact this population as long as it remains outside of the meadow. This area is also being considered for spoils deposition. To avoid rare plants, spoils will not be deposited in, nor a road built through the large tall sedge fen meadow between the power house and dam.

Karst: No karst resource concerns identified.

Scenery: No concerns.

Heritage: The bridge over Thayer Creek will be located with an archaeologist on site to provide input on location and avoidance of cultural features. If cultural features cannot be avoided, effects to site and features will be designed to minimize effects. If sites and/or cultural features cannot be avoided or effect minimized, effects to site will need to be mitigated.

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

Stream Crossings

Road Name: Pipeline

1) Mile: 1.8 AHMU: III Channel Type: HC2 BF Width: 6 BF Depth: 1 Substrate:
Angular
gravel, some
cobble and
bedrock.

Gradient: 5-7% Structure: 60" Pipe Passage Req'd: N Timing Dates: n/a

Narrative: The road will cross the stream at a 20 to 30% skew to avoid a larger notch
upslope and steep slopes down slope.

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

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ANGOON HYDROELECTRIC PROJECT ROD



Road Management Objectives

Project/EIS: Angoon Hydroelectric EIS Route No.: N/A Begin M.P.: 0.0	System: Thayer Creek Route Name: Powerhouse Length (miles): 2.4 (based on hip chain)	Land Use Designation: Wilderness Status: Planned Begin Termini: Marine Access Pt. near Little Island End Termini: End of Bridge over Thayer Creek
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General Design Criteria and Elements

Functional Class:	Service Life:	Traffic Service Level:	Surface:	Width:	Critical Vehicle:	Design Vehicle:	Design Speed:
Local	LC	D	Shot Rock	14'	Lowboy	Log Truck	10 mph

Intended Purpose/Future Use: This road serves as the connection between the marine access facility and the powerhouse. The road is the conduit for moving supplies from the Chatham Strait to the powerhouse and dam site and pipeline corridor. After the hydroelectric project's construction phase, the road will continue to be used for maintaining the facilities.

Maintenance Criteria

Begin Milepost	End Milepost	Operational Maintenance Level:	Objective Maintenance Level: (desired future condition)
0.00	2.4	2	2

Maintenance Narrative: The road will be maintained at a Maintenance Level 2 level for the duration of the hydroelectric project.

Operation Criteria

Highway Safety Act: No **Jurisdiction:** Kootznوو

Travel Management Strategies:

Encourage:	N/A
Accept:	Administrative use.
Discourage:	N/A
Prohibit:	Public motorized use.
Eliminate	N/A

Travel Management Narrative: The road will be used for administrative use only.

District Ranger Approval

(signature) _____ Date: _____

Site-specific Design Criteria

Road Name: Powerhouse

Road Location: The road begins at the Marine Access Facility near Little Island and roughly parallels the shoreline. The road ends on the North side of the Thayer Creek Bridge. The road was located away from the beach to minimize visual impacts as seen from Chatham Strait. Near MP 2.1 the road was forced to within about 100 feet of the beach due to steep slopes. Even with the relatively close proximity to the beach, the road will still be concealed by a buffer of old growth forest. The Selected Alternative has a portion of road that was relocated to avoid karst features.

A large construction staging area will be required for construction of the transmission line and the power generation facility. A suitable location for the site was noted between MP 1.4 and 1.5. This area was primarily forested with some forested wetlands, relatively level, with one class IV stream inside the rough staging area boundary.

This road will include a spur to access the powerhouse on the south side of Thayer Creek.

The bridge across Thayer Creek was originally located to cross the creek about 1050 feet below the class I barrier falls. This location was selected because it provided the shortest span between stable banks and would not require significant fill for the approaches. This bridge location was also in the proximity of a heritage site that was unknown to the road locators until a later time. The road locator estimates that the bridge could be moved away from the archeological site to a place about 900 feet below the class I barrier falls. The bridge span will likely increase slightly and an approach fill will be required. This revised location will increase construction costs but not by a substantial amount.

The detailed road location information is provided in the table below.

Milepost (miles)	Average Side-slope (%)	Length (feet)	Comments
0.0 to 0.2	0-15	1134	Easy construction. Road climbs at grades up to 15% and heads southeast before turning toward the north. There is a 180 foot section of 35-50% side slopes.
0.2 to 0.6	0-25	2124	Easy construction. Crossed a small stream in an 18' deep v-notch. The stream in this notch is small. Recommendation is to cut both banks and add an 8' fill in the center of the notch with a 24" pipe (pipe is oversized at 24").
0.6 to 0.8	20-40	780	Primarily easy construction with 15% grades.
0.8 to 0.8	70-90	159	Full bench construction.
0.8 to 1.7	0-25	4843	Easy construction. One 72" stream crossing.
1.7 to 2.3	20-40	3204	Primarily easy construction.
2.3 to 2.4	0	652	Easy construction. 120 foot bridge over Thayer Creek.

Wetlands: The proposed Powerhouse Access Road crosses about 3,283 feet of wetland. The road crosses 0 feet of Tall Sedge Fens. The wetland is both forested wetland and scrub/shrub muskeg. Minimize the road footprint through the wetlands and provide adequate hillslope drainage (33 CFR BMPs 1, 3). Road construction through these wetlands is unavoidable

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

(BMP 14.2). Overlay construction is recommended to minimize disturbance to the wetland and ensure hydraulic connectivity of the roaded wetland with the surrounding areas (BMPs 12.5 and 14.17).

Erosion Control: An erosion control plan for construction and maintenance will be developed according to standard project specifications (BMP 14.5). The plan will address excavation and endhaul in the vicinity of steep slopes (MP 0 to 0.2, MP 0.8), erosion control during construction and post-construction at stream crossings MP 1.0 and MP 2.4, erosion control during construction and post-construction at rock pits, and revegetation materials and schedules.

Rock Pits: Potential rock pits were not noted during the location of this road segment. However, it is likely that rock pits could be developed near MP 0.1 and MP 1.7. Roughly 31,000 cubic yards of shot rock will be needed to construct this road. During periods of high rainfall (as defined in current Regional specifications), blasting operations will be suspended at quarries or road construction near potential unstable sites where ground vibration may induce mass movement (BMP 14.6). Additional blasting may be necessary at other locations along the road; the Regional specifications for blasting apply to these locations as well.

Resource Information:

Soils/Water: Road location avoids unstable areas in accordance with Forest Plan direction. Thayer Creek crossing (Milepost 2.4) is upstream of mean high tide, in the vicinity of transition between estuary and low gradient, large substrate (LC) channel. Crossing location is tradeoff between road grade control point on north side of stream, archeological concerns, and consideration for minimal fill and excavation adjacent to stream. Road footprint and clearing limits will be approved prior to any timber falling or ground disturbance within 100 feet of Thayer Creek. No timber may be sold from this area in accordance with Tongass Timber Reform Act. At Mileposts 1.0 and 2.4: Minimize equipment crossing and streambank disturbance during construction. Avoid moving natural debris, control construction-related sediment and direct to settling area (BMP 14.14). Structures accommodate at least 50 year flood flow and expected debris and do not constrict natural channel width (BMP 14.17).

Fisheries: Fish passage is required at stream crossing mp 1.0. Installation of a 72" culvert must abide by State of Alaska fish passage standards. It will be difficult to retain bedload within a culvert in a stream with 4% slope.

Wildlife: Minimize the footprint of road construction and other development activities within 500 feet of the anadromous portion of Thayer Creek to minimize effects to brown bear use of key foraging areas. No vegetation management or project related activities within 330' of any bald eagle nest tree. No blasting within ½ mile of active bald eagle nests. Surveys will be required to identify active nests. If these measures are not feasible, a variance will be required from the US Fish and Wildlife Service.

Botany: No concerns.

Karst: The karst is avoided through a reroute around the karst feature (using a 100-foot buffer). The road as located in the Selected Alternative has no concerns for karst.

Scenery: The smallest area needed for the marine facility would be cleared of trees and vegetation. During construction, shoreline rocks would be protected from scarring or damage. Where feasible, a windfirm buffer of mature trees must be left along the shoreline in the Chatham Strait Shoreline Viewshed (Figure 3-5, Chapter 3), to screen the transmission facilities, access road and construction staging area from the Visual Priority Travel Routes and Use Areas.

Heritage: The bridge over Thayer Creek will be located with an archaeologist on site to provide input on location and avoidance of cultural features. If cultural features cannot be avoided, effects to site and features will be designed to minimize effects. If sites and/or cultural features cannot be avoided or effect minimized, effects to site will need to be mitigated.

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

Stream Crossings

Road Name: Powerhouse

1) Mile: 1.0 **AHMU: II** **Channel Type:** **BF Width: 12** **BF Depth: Not** **Substrate:**
noted Gravel

Gradient: 4% **Structure: 48" CMP, oversize** **Passage Req'd: Yes** **Timing Dates:**
to 72" or log stringer bridge

Narrative: Class II status; the structure must allow fish passage.

2) Mile: 2.4 **AHMU: I** **Channel Type:** **BF Width: 100** **BF Depth: 3** **Substrate:**
ES4/LC2 transition cobble

Gradient: 1% **Structure: 120 foot bridge** **Passage Req'd: Yes** **Timing Dates:**

Narrative: Thayer Creek. Revised bridge location is likely to require a bridge slightly longer than 120 feet.

ANGOON HYDROELECTRIC PROJECT ROD

MILES: 4.03

0 0.61 1.21 Miles

MAP SCALE: 1:38385



Road Management Objectives

Project/EIS:
Angoon Hydroelectric EIS

System: Thayer Creek

Land Use Designation:
Wilderness and Other

Route No.: N/A

Route Name: Line

Status: Planned

Begin M.P.: 0.0

Length (miles): 4.5
(based on hip chain and
visual estimate)

Begin Termini: Station
11+34 of the Powerhouse
Road

End Termini: A
beach across the inlet
from Angoon.

General Design Criteria and Elements

Functional Class:	Service Life:	Traffic Service Level:	Surface:	Width:	Critical Vehicle:	Design Vehicle:	Design Speed:
Local	LC	D	Shot Rock	14'	Log Truck	Log Truck	10 mph

Intended Purpose/Future Use: The road serves the access needs along the transmission line. The road will be needed after the construction phase for transmission line maintenance.

Maintenance Criteria

Begin Milepost	End Milepost	Operational Maintenance Level:	Objective Maintenance Level: (desired future condition)
0.0	4.5	2	2

Maintenance Narrative: The road will be maintained at a Maintenance Level 2 level for the duration of the hydroelectric project.

Operation Criteria

Highway Safety Act: No **Jurisdiction:** Kootznoowoo

Travel Management Strategies:

Encourage:	N/A
Accept:	Administrative use.
Discourage:	N/A
Prohibit:	Public motorized use.
Eliminate	N/A

Travel Management Narrative: The road will be used for administrative use only.

District Ranger Approval

(signature) _____ Date: _____

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

Site-specific Design Criteria

Road Name: Line

Road Location: The road begins at Station 11+34 of the Powerhouse road. The road travels 0.8 miles before ending at a 100' deep and 626 foot wide stream notch. The road starts again on the other side of the notch and makes its way to a beach across the inlet from the Village of Angoon. For simplicity, the detailed road location information is provided in the table below.

During the field season a portion of the road was located on lands not approved in ANILCA for construction activities. The mistake was not discovered until after field season. The road has since been relocated through photo interpretation and the evaluation of topographic maps. Efforts to field verify the revised road location early in the 2009 field season is anticipated to be straightforward. The road segment in question is shown as an estimate in the table below. The actual length of the estimated road segment is likely to be shorter than what is currently shown.

Milepost (miles)	Average Side-slope (%)	Length (feet)	Comments
0.0 to 0.8	0-40	4372	Easy construction with an occasional steep side slope up to 60%.
0.8 to 0.9	N/A	626	100' deep notch with a 20' stream in the bottom. If a crossing were attempted, construction would be difficult (expensive) and a road realignment would be necessary to get down into the notch where a bridge could cross the stream.
0.9 to 1.3	0-40	1948	Easy to moderate construction. Some cuts and fills will be required.
1.3 to 1.6	20-40	1627	Easy to moderate construction with a 300 foot section of 30-60% slopes and some steep grades.
1.6 to 2.6	0-30	5254	Easy construction. Skirted the edge of several muskegs. At Milepost 2.5 road location may enter lake buffer to avoid steep slopes for about 200'.
2.6 to 3.4 (estimate)	0-40 (estimate)	4277 (estimate)	Used photo interpretation and topographic maps to estimate easy to moderate construction.
3.4 to 3.8	0-40	2367	Easy construction.
3.8 to 3.9	40-50	135	Moderate construction, steep grades.
3.9 to 4.5	0-10	3155	Easy construction.

Wetlands: The Inlet Road and Transmission Line cross about 6,720 feet of wetland. The road crosses 0 feet of Tall Sedge Fens. The wetland is both forested wetland and scrub/shrub muskeg. Minimize the road footprint through the wetlands and provide adequate hillslope drainage (33 CFR BMPs 1, 3). Road construction through these wetlands is unavoidable (BMP 14.2). Overlay construction is recommended to minimize disturbance to the wetland and ensure hydraulic connectivity of the roaded wetland with the surrounding areas (BMPs 12.5 and 14.17).

Erosion Control: An erosion control plan for construction and maintenance will be developed according to standard project specifications (BMP 14.5). The plan will address

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

excavation and endhaul in the vicinity of steep slopes (MP 3.3), erosion control during construction and post-construction at stream crossings, erosion control during construction and post-construction at rock pits, and revegetation materials and schedules.

Rock Pits: Potential rock pits were noted at MP 0.3, MP 1.2, MP 3.3, MP 3.9, and between MP 4.3 and 4.4 it may be possible to develop a shallow rock pit. Roughly 59,000 cubic yards of shot rock will be needed to construct this road. During periods of high rainfall (as defined in current Regional specifications), blasting operations will be suspended at quarries or road construction near potential unstable sites where ground vibration may induce mass movement (BMP 14.6). Additional blasting may be necessary at other locations along the road; the Regional specifications for blasting apply to these locations as well.

Resource Information

Soils/Water: Road location avoids unstable areas in accordance with Forest Plan direction. At stream crossings: Minimize equipment crossing and streambank disturbance during construction. Avoid moving natural debris, control construction-related sediment and direct to settling area (BMP 14.14). Locate road at least 100 feet from lake where feasible.

Fisheries: Fish passage will be required in all identified fish streams and must be designed to meet State of Alaska fish passage standards.

Wilderness: Adjustments to the overhead line and access road clearing corridor may be necessary because of the close proximity of the wilderness boundary (in Section 18, T. 50 S., R.68 E.) and the lakes (in Section 13, T. 50 S., R.67 E.). These adjustments could include reducing the width of the corridor to stay within the ANILCA sections and reduce impacts to scenery at the lakes.

Wildlife: No vegetation management or project related activities within 330' of any bald eagle nest tree. No blasting within ½ mile of active bald eagle nests. Surveys will be required to identify active nests. If these measures are not feasible, a variance will be required from the US Fish and Wildlife Service.

Botany: Three populations of the rare moonwort, *Botrychium virginianum*, are known on the road section between the marine facilities and Stillwater Anchorage. The first population is in meadow at the northern tip of the larger, most northern lake about 100 meters west of the road. The other two populations are located in the meadow surrounding the north and east side of the more southern small lake. One of these populations is on the east side of the lake approximately 175 meters from the road. The other population is on the north end of this smaller lake and is approximately 50 meters south of the proposed road route. This population is the most vulnerable to disturbance effects due to its proximity to the road, but impacts are unlikely as long as the current route is followed and the meadow is not disturbed. The other populations are also unlikely to be impacted by the current proposed road.

Karst: No karst resource concerns identified.

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

Scenery: In the Lakes Viewshed (Figure 3-5, Chapter 3), a minimum of 100-foot wide buffer of mature trees must be maintained between the project elements and lakeshores, where feasible.

Heritage: The southern terminus of the road will be located with an archaeologist on site to provide input on location and avoidance of cultural features. If cultural features cannot be avoided, effects to site and features will be designed to minimize effects. If sites and/or cultural features cannot be avoided or effect minimized, effects to site will need to be mitigated.

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

Stream Crossings

Road Name: Line

1) Mile: 0.4 AHMU: III Channel Type: BF Width: BF Depth: Substrate:
banks are not banks are not Gravel/
clearly defined clearly defined cobble
Gradient: 25-35% Structure: 24" CMP Passage Req'd: No Timing Dates: None

Narrative: This class III stream is a stable alluvial fan with no signs of recent high flows. At the time, all water was running subsurface.

2) Mile: 0.9 AHMU: II Channel Type: BF Width: 20' BF Depth: 3' Substrate:
Gravel/
cobble

Gradient: 5-10% Structure: N/A Passage Req'd: N/A Timing Dates:

Narrative: 100 foot deep incision. Recommend approaching this incision from Angoon and from Little Island to avoid crossing this stream.

3) Mile: 1.5 AHMU: II Channel Type: BF Width: 4 BF Depth: 1 Substrate:
Small
gravel/
muck

Gradient: 2-3% Structure: 24" Pipe Passage Req'd: Yes, Timing Dates:
if fish present

Narrative: Class II status has not been verified. If stream is a class II, the structure must allow fish passage.

4) Mile: 1.6 AHMU: II Channel Type: BF Width: 12' BF Depth: 2' Substrate:
Gravel with
some
cobbles

Gradient: 5% Structure: 30' Log Stringer Bridge or 60" to 72" pipe. Passage Req'd: Yes, Timing Dates:
if fish present.

Narrative: Class II status has not been verified. If stream is a class II, the structure must allow fish passage.

Angoon Hydroelectric Project ROD – Appendix 1, Road Cards

5) Mile: 2.1 AHMU: II Channel Type: BF Width: 8' BF Depth: 2' Substrate:
Small
gravel/
muck

Gradient: 2% **Structure:** 20 foot log stringer bridge or 48" pipe **Passage Req'd:** Yes, if fish present **Timing Dates:**

Narrative: Class II status has not been verified. If stream is a class II, the structure must allow fish passage.

6) Mile: 2.3 AHMU: II Channel Type: BF Width: 5' BF Depth: 1' Substrate:
Gravel/
cobble

Gradient: 5% **Structure:** 35' log stringer bridge or 60" pipe **Passage Req'd:** Yes, if fish present **Timing Dates:**

Narrative: Class II status has not been verified. If stream is a class II, the structure must allow fish passage.

7) Mile: 3.2 AHMU: II Channel Type: BF Width: 3' BF Depth: 1' Substrate:
Muck/
gravel

Gradient: 3% **Structure:** 36" Pipe **Passage Req'd:** Yes, if fish present **Timing Dates:**

Narrative: Class II status has not been verified. If stream is a class II, the structure must allow fish passage. The information for this stream is an estimate. This stream is located in the road segment that will be field verified in 2009. The revised road location will cross upstream from this point.

Appendix 2

Monitoring

Project-specific Monitoring

Monitoring requirements are established in the approved Plans of Operations required by the Forest Service SUA and in permits and approvals issued by other State and Federal agencies. Monitoring is designed to determine if the goals, objectives, standards and guidelines, and practices of the Forest Plan are implemented in accordance with the 2008 Forest Plan. Routine implementation monitoring is part of the administration of a special use authorization.

Additional detail on resource monitoring, including water resource monitoring, is found in the resource reports (see for example Thompson 2009). Monitoring displayed in Table R2-1, summarizes the monitoring requirements and authority for each resource.

Table R2-1. Monitoring

Resource Item or Activity to Monitor	Method of Monitoring	Frequency of Monitoring	Threshold of Variability	Action to be Taken	Authority	Responsible Party
Project Final Design Plans						
Design and construction plans of all authorized facilities in the project proposal	Review and approve plans, drawings, and location of facility and development staking.	Once prior to authorizing the start of construction.	Non-conformance with approved design specifications or permit requirements	Determined by authorized agencies	Forest Service ROD, Plans of Operations, Section 404 permit, ADNR title 38 permit	Forest Service, USEPA, USACE, and ADNR, Kootznoowoo, Inc.
Karst and Cave Resources						
Locations for roads, transmission cables, and all related facilities	Review and approve plans, drawings, and location of facility and development staking.	Once prior to authorizing start of construction.	Karst surface features will be located and identified in the field. A 100-foot, no disturbance buffer will separate construction activities from karst surface features (USDA Forest Service 2008a)	Construction will only be authorized if field review of survey staking and submitted plans and drawings are approved by the Forest Service.	Federal Cave Resources Protection Act, Tongass Forest Plan, Forest Service ROD	Forest Service
Soils and Wetlands						
Locations for roads, transmission cables, and all related facilities	Review and approve plans, drawings, and location of facility and development staking.	Once prior to authorizing the start of construction.	Non-conformance with approved design specifications or permit requirements	Determined by authorized agencies	Forest Service ROD, Plans of Operations, Section 404 permit	Forest Service, USEPA, USACE, and ADNR, Kootznoowoo Inc.

Table R2-1. Monitoring

Resource Item or Activity to Monitor	Method of Monitoring	Frequency of Monitoring	Threshold of Variability	Action to be Taken	Authority	Responsible Party
Fisheries/Water Resources						
Pre-project Streamflow and Temperature Data Collection	Rantz et al (1982)	Continuous, begin as soon as practical	n/a (pre-project requirement)	Refine project design and operating plans	Project ROD	Kootznoowoo, Inc.
Post-project Instream Flow Monitoring	Rantz et al (1982)	Continuous	As determined by instream flow requirement	Reduce diversion to accommodate instream flow requirement	Project ROD	Kootznoowoo, Inc.
Post-project Stream Temperature Monitoring	U.S. Environmental Protection Agency. 2003. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002.	Continuous	1) verify return flow temperature is within 2° C of receiving waters, and 2) trigger visual monitoring of frozen streambed conditions if Reach B is bypassed (below).	Consult and review with USFS and ADFG	Project ROD	Kootznoowoo, Inc.
Post-project Frozen Streambed Monitoring	To be developed by Kootznoowoo, Inc. with review and approval by USFS	As triggered by stream temperature monitoring (once annually at minimum)	To be determined	Consult and review with USFS and ADFG	Project ROD	Kootznoowoo, Inc.
Post-project Bedload and Floating Debris Monitoring	To be developed by Kootznoowoo, Inc. with review and approval by USFS	Spring and Fall High Flows	To be determined	Pass sediment and debris into bypass reach	Project ROD	Kootznoowoo, Inc.

Angoon Hydroelectric Project ROD – Appendix 2, Monitoring

Table R2-1. Monitoring

Resource Item or Activity to Monitor	Method of Monitoring	Frequency of Monitoring	Threshold of Variability	Action to be Taken	Authority	Responsible Party
Pre- and Post-project Reach B Streambed and Large Wood Monitoring	USFS 2001	Every five years	If the gravel component (currently 32% by pebble count) declines. If total wood counts decrease below the 25th percentile of reference conditions (Bryant et al 2004)	Forest Service and Alaska Department of Fish and Game will consider results and possible actions in response.	Project ROD	Kootznoodoo, Inc.
Vegetation						
Rare and sensitive plant populations	Conduct inspections of facility and development staking.	Once prior to authorizing start of construction.	Evidence of sensitive/rare plant populations in development areas.	Construction will only be authorized if field review of survey staking and submitted plans and drawings are approved by the Forest Service.	Forest Service ROD.	Forest Service
Invasive plant populations	Conduct inspections of facilities and developments	Annually for first 3 years following construction, and biennially thereafter for the life of the project.	Evidence of invasive plant populations in development areas.	Control high priority invasive plant infestations. Report inspections and control actions to District Botanist.	Forest Service ROD, EO 13112	Kootznoodoo, Inc.
Timber Removal: Compliance with timber sale contract provisions and brush disposal plan	Conduct onsite inspections	Before, during and after harvest activities	Compliance with contract clauses and brush disposal plan provisions.	Return to compliance	36 CFR part 233	Forest Service

Angoon Hydroelectric Project ROD – Appendix 2, Monitoring

Table R2-1. Monitoring

Resource Item or Activity to Monitor	Method of Monitoring	Frequency of Monitoring	Threshold of Variability	Action to be Taken	Authority	Responsible Party
Wildlife						
Bald eagle nests related to construction activity	Visual survey, using water or air craft with ground searches under nest trees if necessary	Nests within ½ mile of project activities should be surveyed twice during March 1 to May 31. Nests active after this period should be monitored weekly until young have fledged.	Zero project related activity within the management zone of active nests unless a variance is obtained from the USFWS	Cease construction activities within management zone of active nests	Bald Eagle Protection Act	Kootznوو Inc.
Road Closures	On the ground survey	Periodic visits, particularly during hunting season	Any evidence of unauthorized use	Report unauthorized use to the Forest Service	Forest Service ROD, Project ROD; Violators will be ticketed by the FS under 36 CFR 261.54(b)	Kootznوو Inc.
Cultural Resources/Effects to Historic Properties						
Ground disturbing activities	Qualified archaeologist to monitor ground disturbance according to the terms of the SUA.	During ground disturbance	Effect to historic property	Work will cease and the Forest Service will be notified. Work will proceed only after the consultation process has been completed and a plan to mitigate the effects has been developed if needed.	NHPA NAGPRA	Kootznوو Inc. in consultation with Forest Service and SHPO

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